

• E. E. Fowler

1871

W.E.C.
A

Thomas Croker

~~the gift of his
wife~~

TREATISE
ON
PAINTING,

BY

LEONARDO DA VINCI.

TRANSLATED FROM

THE ORIGINAL ITALIAN.

ILLUSTRATED WITH A GREAT NUMBER OF CUTS.

TO WHICH IS ADDED

THE LIFE OF THE AUTHOR,

And a PORTRAIT from a PICTURE in the
DUKE OF TUSCANY'S GALLERY AT FLORENCE.

A NEW EDITION.

Quam multa vident Pictores in Umbris, et in Eminentia.

CICERO.

LONDON:

PRINTED FOR I. AND J. TAYLOR,
At the ARCHITECTURAL LIBRARY, High Holborn.

1796.



ADVERTISEMENT.

THE Publishers of this Edition of Leonardo da Vinci's Treatise, assure the Public it is given without any variations from the former Edition, which has been so much admired, and so much in request by all persons studying the Polite Arts.

It is needless here to say any thing in praise of Leonardo's book, which, like all his other productions, has obtained an increasing fame; nor is it needful to make an apology for reprinting a Work, which could not be procured but at an extravagant price, nearly treble the cost of the present Publication.

Instead of the Portrait given to the former Edition, one more authentic has been substituted, engraved by a very respectable Artist from a Picture in the Duke of Tuscany's Gallery, at Florence; which is unquestionably a good likeness, and a fine picture.

ADVERTISEMENT.

The high reputation of Leonardo cannot fail of being much augmented by the engravings, which, we have the pleasure to announce, are about to be published by Mr. Chamberlaine, from his drawings of Figures, Heads, Anatomy, &c. in the King's Library, and which, till now, to the great regret of all lovers of the art of Design, have lain useless to the Public. They exhibit the knowledge and hand of a great Master.

* * * *To this Edition is added, from the original Italian, the Female Figure, Plate 26.*

THE
TRANSLATOR'S PREFACE.

LEONARDO da Vinci was a man so happy in his genius, so consummate in his profession, so accomplished in the arts, so knowing in the sciences; and withal, so much esteemed by the age wherein he lived, his works so highly applauded by the ages which have succeeded, and his name and memory still preserved with so much veneration by the present age; that, if any thing could equal the merit of the man, it must be the success he met with.

Scarce ever, perhaps, was there a man of so extensive, and yet of so accurate a thought; who could range over such vast fields of science, and, at the same time, attend so closely to the minute circumstances. It is this that seems to make up *Leonardo's* character; it is this that distinguishes him from the rest of mankind; and in this view he stands, not only above the greatest painters, but on a level with the greatest men.

It is not to bespeak the reader's favour in behalf of the following Treatise, that we introduce it with an eulogy on its Au-

thor; on the contrary, the merit of the author, if need were, might be fairly argued from the excellency of the Treatise: and, indeed, they are so well matched, the one to the other, that, as *Leonardo* could not have written a less masterly piece, so neither could that have come from the hands of a less able master.

A man who compares the following account of his *Life*, with the *work* to which it is prefixed, will clear the historian of all flattery, or false colouring; there being scarce any thing advanced in his favour, in the former, but what seems authorized by something seen in the latter; so that these, without any great impropriety, may be said to be counter parts to each other.

How vast, how immense an art is painting, as considered and handled by *Leonardo*! scarce any thing in the whole system of nature but comes within it's compass. Not the minuteness of the smallest things, not the magnitude of the largest that secures them from it's cognizance: nay, as if the various appearances of the material world were too scanty, too limited a sphere; it reaches out into the intellectual world; takes in the motions and passions of the human soul; and by the force of *light* and *shadow*, makes the operations of an incorporeal agent, the visible objects of a corporeal organ.

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The province of a painter, as our Author has fixed it's boundary, seems too wide and spacious to have been ever discharged in it's full extent, by any man but himself. The management of the pencil, and the mixture of colours, with the knowledge of perspective, and a habit of designing, wherewith most painters seem to content themselves, make but a part of the art, as understood by *Leonardo*. To these he calls in the assistance of other arts; anatomy, optics, meteorology, mechanics, &c. searching attentively into the powers of nature, in order to form an art that may imitate her; and from the depths of philosophy, drawing means for the improvement of painting.

It is not in painting alone, but in philosophy too, that *Leonardo* has surpassed all his brethren of the pencil; nor does it appear in the least improbable, but that it was his uncommon skill in the latter, to which, in good measure, he owed his surprising success in the former. The truth is, these are two faculties that may be nearer akin, than every one, perhaps, is aware of: nor would there be any thing, methinks, very daring in the assertion, should I affirm, that philosophy is absolutely necessary by way of preliminary to painting. To paint, it is allowed, is to imitate nature: but is not the *knowledge* of nature evidently requisite to the *imitation* thereof? And must it not be pleasant to see

men about to represent natural objects, who are unacquainted with the nature and properties of the objects to be represented? *Quacks*, indeed, there may be in painting, as well as in other professions; but to become a *regular* painter, it is indispensably necessary that a man serve an apprenticeship to philosophy. We have people who pretend to cure diseases, without knowing any thing of the animal œconomy, or of the powers of medicines; and we have others who would be thought to paint by the mere mechanism of a hand, and a pencil moving in this and that direction: but, as the college will never allow the former to be physicians; so I see no reason why the latter should be complemented with the title of painters.

The example and success of *Leonardo* cannot fail, sure, to animate our painters to the study of philosophy and mathematics. If their great master could turn the *old* philosophy of his age to so good an account in painting; what might not be expected from the system of nature, as it stands under it's present improvements by the moderns? We see what laudable uses he makes, even of a defective doctrine of light. To what a pitch would he have carried his art, had he been acquainted with the new, the noble, the *Newtonian* theory of light and colours. What improvements would not he have made, had the discoveries of a *Bacon*, or a *Boyle*, been

been known in his days, or had it been his fortune to have lived in ours? I know not how our painters will answser it, if their art should seem to decline, at a time, when the knowledge of nature, and of *geometry*, which are the very basis whereon it is built, is so wonderfully improved: but this I dare venture to pronounce, that they will never reach *Leonardo* in painting, till they have first rivalled him in philosophy.

The Reader is not to expect, in the following pages, to find a just, a methodical institution of the Art of Painting: what he has to look for, is a noble collection of useful precepts, and curious observations on the several parts of that art. Instead of treating us with a dry, an insipid system, dully drawn out into it's divisions and subdivisions, our Author hospitably leads us into his closet, sets before us the finest, and most valuable parts of his knowledge, and entertains us with the precious fruits of all his labours, his hard studies, and long experience. It was not for a man of his genius to sloop to the A B C of his art; to take the raw pupil into his tutorage, and to lead him step by step, from stage to stage: that were the proper province of some heavy pedant, and could never suit a man of *Leonardo*'s mercury. Yet does he not leave the young painter absolutely at large, or abandon him intirely to the mercy of his stars; but

wanting leisure to attend him himself, he very civilly gives him directions for his conduct: thus, at the beginning of his work, we find him instructing the novice in a method of study, chalking out the course he is to steer, and pointing out the several dangers to be avoided.

If any objections lie against *Leonardo's* performance, they must be drawn, either from the looseness and inaccuracy of his style, or the want of order and connection in his periods; both of which are not only easily accounted for, but, all things considered, easily excused too. For the Treatise, it is owned, never had the finishing hand of it's Author; and though he might intend it for the press, it is evident that it was never prepared for it. So that we have here the elements of a work, not the work itself, mature, and finished; we have the matter, but the form is wanting. *Leonardo*, we are assured, knew too well the powers of symmetry and proportion, to have sent any thing into the world that might appear disorderly and indigested: nor will his talent at style and elocution admit of the least dispute. I am much mistaken in the man, if he could not have written as correctly as he painted; and have struck the imagination as warmly with his pen, as his pencil. But when a man considers that busy scene of life wherein he acted; that amazing variety of studies and exercises

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which he went through, and of undertakings that he atchieved, it is so far from being strange, methinks, that his writings are not elaborate and finished, that it is next to a miracle he should ever have written at all.

In the original of the following Treatise, it must be owned there are some things so very dubious and obscure, that a man who reads it, finds occasion for his guessing faculty oftener than he would wish. But this is not all; for in some places it is not bare obscurity, but mere midnight darkness. The style, which at best is very negligent, is sometimes scarce consistent: so that one would be tempted to think, that the Author were, sometimes, writing for his own sake, rather than that of the world; and that he were taking down loose notes to ease his own memory, rather than writing a just Treatise for the use of the public.

As to the want of method, which makes the other objection against the work, though it flows from the same source with the want of style, yet is it more easily forgiven: for this brings somewhat of merit along with it, to compensate for it's failure. Thus, if we have not a just order, and a strict chain running through the work, neither are we troubled with those dull, those formal transitions, which in that case would be unavoidable. If we lose somewhat by having things of like kind dis-

disjoined, and promiscuously intermingled with others to which they bear no relation, yet we are gainers in another sense; since the scene, by this means being often and unexpectedly shifted, we are agreeably amused, our attention is kept alive, and we are secured from sinking into that dullness and indolence, to which a more formal, more methodical induction would be apt to betray us. The prospect, here, never palls upon the eye; it is ever new, ever changing: no sooner is it's novelty gone, and the edge of curiosity taken off, but it vanishes, and the mind is opportunely relieved with the appearance of a new one.

Again, if we consider the age wherein the Author wrote, we shall find ourselves furnished with one further argument in favour of his want of method: for, as the work now stands, loose and unconnected, such of the obsolete *dogmata* of those days, as occur, lie entirely at the Reader's mercy, and may be thrown by, and passed over without the least damage to the rest of the work; whereas, had the whole been woven into a regular system, there had been no taking out, without tearing; the drawing of a few *threads*, would not only have disfigured the rest, but have even endangered the unravelling of the whole *piece*. It is for this reason, perhaps, that my lord Bacon's *Silva Silvarum*, which is written

written perfectly in *Leonardo's* manner, continues still in use and esteem; while the more methodical productions of most of our system-mongers, are become antiquated and out of date.

Having said thus much concerning my Author, and his work, the Reader will now give me leave to put in a word concerning myself, and my performance. The brevity and the abruptness of the original made a strict translation altogether unadvisable; it being frequently impossible to express the Author's meaning, in any tolerable *English*, without the help of a little periphrasis. That, however, is a liberty which I have never taken, but on the most urgent occasions; nor even then, but with as much moderation as might be. My predecessor, Mons. *Chambre*, the applauded Author of the *French* translation, has taken the same measures; I wish it may only prove with the same success. That gentleman's performance, I must own, indeed, to be masterly, beyond most translations I have seen; and yet with all it's virtues, it cannot be denied but that it has it's failings too. In the course of my translation, I found myself pretty frequently under a necessity of dissenting from him, and of putting constructions on my Author, very different from what I found in his version. But mistakes of this kind ought, perhaps, to be laid at the printer's,

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or the publisher's door, rather than at his; it appearing in no wise probable, that those happy turns which are seen in some places, and those glaring oversights which appear in others, should come from the same hand. As to the figures, a bare *out-line* we thought sufficient for the purpose: to have given finished designs, would have added considerably to the price of the book, without any addition to it's real value; these being in no wise necessary, excepting where the *relievo* of a body, the diminution of a colour, or the quality of stuffs in a drapery, are concerned; and on those occasions we have never failed to make use of them. Instead of dividing the book into chapters, and prefixing titles to each, as they stood in the former editions, it has been thought proper barely to throw the work into distinct paragraphs, and to affix the subject matter on the margin: for, in the former case, besides that the course of the reading was too much interrupted, the shortness of the chapters, and the length of the titles, would have proved matter of raillery to some readers, who might have been scandalized to see the *head* sometimes as big as the body.

THE
L I F E
OF
LEONARDO DA VINCI.

LEONARDO da Vinci was born in the castle of *Vinci*, situate in the valley of *Arno*, a little below *Florence*. His father was *Pietro da Vinci*, a man of a very narrow fortune; who having observed his son's inclination to painting, by several little draughts and sketches, which he made while he was a child, resolved to give him what further helps he was capable of. With this view he carried him to *Florence*, where he placed him under the care of his friend *Andrew Verocchio*, a painter of some reputation in that city. *Andrew* already saw something very ex-

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traordinary in the young man, and was engaged to be careful of his education, not only by the friendship which he owed his father, but by the sweetness and vivacity which appeared in the son. Here *Leonardo* found wherewithal to satisfy the strong propensity which he bore to all the arts that depend upon drawing; for his master was not only a painter, but an engraver, architect, carver, and goldsmith; and so great a proficient did the young *Leonardo* become, that in a little time he exceeded *Verocchio* himself.

This was first discovered in a painting of our Saviour's baptism, which *Andrew* had undertaken for the religious of *Valombrofa*, without *Florence*. He would needs have his pupil assist in the performance, and gave him the figure of an angel, holding some drapery, to paint: but he soon repented his forwardness, for *Leonardo*'s angel proved the finest figure in the piece, and visibly discredited all the rest. *Andrew* was so deeply mortified on this occasion, that he took his leave of painting, and from that time never meddled with pallet or pencil more.

Leonardo thought now that he needed not a master, and accordingly quitting *Verocchio*, he goes to work by himself. Several paintings, which he made about this time,

time, are still to be seen in *Florence*. He likewise painted a carton, for the king of *Portugal*, wherein *Adam* and *Eve* were represented in the garden. This was a finished piece, the two capital figures were extremely graceful, the landscape full of beauty, and the very shrubs and fruit were touched with incredible exactness. At his father's request, he made a painting for one of his old neighbours at *Vinci*; it consisted wholly of such animals as we have naturally an aversion to, and these he joined so artfully together, and disposed in such humourous attitudes, that, like *Medusa*'s head, it struck those who saw it with horror and amazement. His father easily perceiving that this was not a present for a country farmer, sold it to some merchants; of whom it was afterwards bought by the duke of *Milan*, for 300 florins.

He afterwards painted two very valuable pieces; in the one was represented our lady, and besides her, a vessel of water, with flowers standing out of it. In this he shewed a great deal of address, the light reflected from the flowers, being made to throw a pale redness upon the water. This has been since in the possession of pope *Clement* the Seventh.

The other was a design which he made for his friend *Antonio Segni*. In it he

had represented *Neptune*, in his carr, drawn by sea-horses, and attended by tritons and sea-gods ; the heavens appeared overspread with clouds, which were driven to all parts by the violence of the winds ; the waves were seen to roll, and the whole ocean appeared in an uproar.

This piece was perfectly in the character and manner of *Leonardo*, for his genius was vast, and his imagination lively ; and though he knew that a just proportion was the source whence all real beauty proceeded, yet was he to a degree fond of any thing whimsical or uncommon ; insomuch that, if he chanced to meet a man with any thing odd or ridiculous in his person, he would not fail to follow him, till having viewed the object with attention, and fixed the idea in his mind, he could make a draught of it at his own lodgings. *Paul Lomazzo*, in his treatise of painting, assures us, that *Aurelo Lovino* had a book of draughts, wholly performed by *Leonardo*, in this kind. One may judge of his talent this way, by a painting still to be seen in the palace royal at *Paris*. The figures are two horsemen engaged in fight, and struggling to tear a flag from each other. Rage and fury are so admirably expressed in the faces of the two warriors, their air appears so wild, and the drapery is thrown into

into so unusual, though, at the same time, so agreeable a disorder, that a person who looks on them, is struck with horror, and tickled into laughter, at the same time. I pass over a *Medusa*'s head which he painted; and another piece representing the *magi* doing homage; though there are some fine heads in the latter. But his fancy being extremely brisk and volatile, he left both these, and several others of his works, unfinished. Besides, he had so awful an idea of painting, and his knowledge, in each part of it, was so consummate, that, with all his fire and vivacity, he needed a great deal of time to finish what he had begun.

Never was painter more knowing in the theory of his art, than *Leonardo*. He was well skilled in anatomy, a master in optics and geometry, and applied himself to the study of nature and her operations, both on earth, and in the heavens, with wonderful alacrity. So many different studies, and such variety of reflections, as they present, furnished him with all the knowledge which a painter could wish for, and rendered him the ablest person that his profession has ever known.

However, his studies did not terminate here; but having an universal genius, and a taste for all the polite arts, he applied himself

himself to them all, and excelled in every one. He was a good architect, an able carver, and extremely well versed in the mechanics. He had a fine voice, understood music well, sung to a miracle, and played better than any musician of his time. Had he lived in the fabulous ages, the *Greeks* would doubtless have made him the son of *Apollo*; and would have been the more confirmed in their opinion, in that the same inspiration which made him a painter and a musician, made him a poet too; and that the several talents, which are shared among the sons and disciples of that god, were all united in him. The following *sonnetto* is all that is left us of his poetry:

Sonnetto Morale.

*Chi non puo quel che vuol, quel che può voglia,
Che quel che non si può folle è volere.
Adunque saggio è l'huomo da tenere,
Che da quel che non può suo voler toglia.*

*Pero ch' ogni diletto nostro e doglia
Sta infi e no saper voler potere,
Adunque quel sol può che co'l douere
Ne trahe la ragion fuor di sua soglia.*

*Ne sempre è da voler quel che l'huomo puote,
Spesso par dolce quel che torna amaro.
Piansi già quel ch'io volsi poi ch'io l'hebbi.*

*Adunque tu, lettore, di queste note,
S'a te vuoi effer buono, e a gl' altri caro,
Vogli semper poter quel che tu debbi.*

It was surprizing to see *Leonardo* take so much pleasure in exercises, that appeared absolutely foreign to his profession. He was very skilful in the management of a horse, and took delight in appearing well mounted. He handled his arms with great dexterity; and for mien and grace, might contend with any cavalier of his time. His behaviour was perfectly polite, his conversation charming, and his speech agreeable. So many extraordinary qualities meeting together, rendered him the most accomplished person of the age he lived in: his company was coveted by all that knew him; and no man ever enjoyed it without pleasure, or left it without regret.

His time being shared in so many several exercises, may be one reason why so many of his works are left unfinished; and in all probability, has contributed as much thereto, as the quickness of his fancy, which glanced lightly from one thing to another; or even as his ability itself, which would never suffer him to take up with any thing that was indifferent.

Leonardo's

Leonardo's reputation soon spread itself over all *Italy*, where he began to be known for the first man of the age in all the polite arts. *Lewis Sforza*, surnamed the Moor, duke of *Milan*, called him to his court, and appointed him a pension of five hundred crowns. This prince having immediately before established an academy for architecture, prevailed with *Leonardo* to enter himself as a member. This proved the greatest service to the company that the duke could possibly have done: *Leonardo* was no sooner entered, than he banished all the old Gothic fashions, which the former academy, established under *Michelino*, above an hundred years before, had still preserved; and reduced every thing to the happy simplicity and purity of the ancient *Greeks* and *Romans*.

About this time, Duke *Lewis* formed a design of supplying the city of *Milan* with water, by a new canal. The execution of this project was deputed to *Leonardo*, and he acquitted himself of the trust, in a manner that surpassed all expectation. The canal goes by the name of *Mortefana*; being extended, in length, above two hundred miles, and navigable throughout: it passes through the *Valteline* and the valley of *Chiavenna*, conducting the waters of the river *Adda*, to the very walls of *Milan*;

and

and enriching both the city and the adjacent campaign, by it's communication with the *Po* and the sea. This was a noble and a difficult enterprize, every way worthy of *Leonardo*'s genius. He had here several difficulties to grapple with, much beyond what had been met with in digging the ancient canal, which conveys the waters of the *Tesino* to the other side of the city, and which had been made above two hundred years before, while *Milan* was a republic. But *Leonardo* surmounted all opposition, he happily atchieved what some may think miraculous; rendering hills and valleys navigable with security.

In order to accomplish his design, he retired to a seat of his friend *Sig. Malzi*'s, at *Vaverola*. He there spent several years in the study of *philosophy* and *mathematics*; applying himself with double ardour to those parts that might give him light into the work he had undertaken. To the study of *philosophy* he joined the searches of antiquity and history; and, by the way, observed how the *Ptolomys* had conducted the waters of the *Nile* through several parts of *Egypt*; and in what manner *Trajan* had opened a commerce with *Nicomedia*, by rendering navigable the lakes and rivers lying between that city and the sea.

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After *Leonardo* had been labouring for the service of *Milan* in quality of *architect* and *engineer*, he was called, by the duke's order, to adorn and beautify it with his paintings. That prince appointed him to paint our Lord's Supper, for the refectory of the *Dominicans* of *St. Maria delle Gratie*. *Leonardo* surpassed himself in this performance. All the beauties of his art are here shewn in a manner perfectly surprising. The design is grand, but correct; the expression noble; the colouring charming; and the heads admirably well varied. There was a majesty and sweetness in each of the apostles' faces; but, beyond the rest, in those of the two *St. James's*. That of our Saviour was never finished, *Leonardo* despairing to express the idea he had conceived of a *God* incarnate; or even to reach a more exalted beauty than he had bestowed on some of his followers. While *Leonardo* was employed in this piece, the prior of the convent, thinking his progress too slow, would be often importuning him to dispatch; but all his solicitations proving vain, he, at length, had the assurance to carry his complaints to the duke. Upon this *Leonardo* was sent for, and being examined about the painting, he assured his highness that there were but two faces wanting to compleat the piece; the one being

being our Saviour's, and the other that of *Judas*. As to the former, he owned himself unable to finish it; being at a loss how to paint the majesty and beauty of so amiable and august a personage: but promised very speedily to compleat the latter; since, to draw the avarice and ingratitude of *Judas*, he needed nothing but to represent the prior of the Dominicans, who had so basely rewarded him for all the pains he had taken.

This work has always been esteemed *Leonardo*'s master-piece. It was accommodated to that part of the history wherein our Saviour declared to his apostles that one of them should betray him. The sentiments which ought to arise in the breasts of his disciples are finely represented:—the expressions of grief, fear, suspicion, inquietude, and love, are admirable. *Judas* bears all the marks of a traitor and a villain; the treachery that lurks in his breast fits confessed in his face, and the first glance of the eye singles him out from the rest. *Leonardo* has here shewn that he perfectly understood the motions of the soul, knew what effects they have upon the body, and was able to express them in all their force and energy upon the face. In this part of painting, indeed, he was inimitable; and not only excelled all the world, but himself too.

Francis the First was so charmed with this piece, when he saw it at *Milan*, that he was not satisfied till he had tried all means possible, for it's removal into *France*. In the end, however, this was found impracticable, the history being painted on a thick wall, and taking up no less than thirty square feet in area. The copy of this painting now to be seen at St. *Germain*, was made by order of the said *Francis the First*; who, finding the original out of his reach, resolved to have something as like it as he could get. There is another copy of it in large, made by *Lomazzo*, one of *Leonardo*'s pupils, and still preserved in the church of St. *Barnabas*, at *Milan*. From these two copies, the curious may form some idea of the beauties of the original, which is now utterly defaced. For *Leonardo* having painted it in oil, and upon a wall not sufficiently secured from moisture; the dampnes of the place has mixed itself with the colours, and diluted them to that degree, that the wall is now reduced to it's primitive nakedness. In the same refectory of the Dominicans, may be seen another piece of *Leonardo*'s, representing duke *Lewis* and *Beatrix* his duchess, both upon their knees. On the one side of them appear their children, and on the other

other a crucifix. About the same time he likewise painted our Lord's nativity for the duke: which last piece is now preserved in the emperor's cabinet.

Leonardo's skill in anatomy proved of infinite service to him: this enabled him to give a peculiar force to his figures, and to distinguish them by their strength, from those of any other master. This he seemed sensible of, and accordingly took all opportunities of improving it. He held frequent conferences on the subject with *Anthony de Tour*, anatomy professor at *Pavia*; and made abundance of draughts from the life, many of which have been since collected into a book by his scholar, *Francis Melzi*. He drew a book of combats for the use of his friend *Sig. Borromee*, master of arms; in which were represented all the several kinds of engagements both on horse-back and on foot. He likewise composed several treatises for the use of the painters of the new academy; of which he had some time before been chosen director; and which, through his extraordinary care and conduct, was now in a very flourishing condition. After *Leonardo's* death, his writings lay a long time at *Vaverola*, in the hands of *Sig. Melzi*; till at length being freed from their obscurity,

rity, it was their fate to be dispersed to different parts ; as we shall hereafter have occasion to observe.

Leonardo frequently retired to *Vaverola* for the conveniency of his studies. He there found himself perfectly at ease ; his repose being neither interrupted by the visits of his friends, nor the cares of the academy ; and it was in this retreat that he composed the greatest part of his works. But the wars of *Italy* began now to break in upon his quiet : he found his patron, the duke, engaged in an unhappy war, and not only the academy, but even the state, in danger. The event proved altogether as melancholy as the presage had been : duke *Lewis* was defeated, taken prisoner, and carried into *France*, where he died in the castle of *Loches*. The academy, in fine, was destroyed, the professors turned adrift, and the arts effectually banished out of *Milan*.

Italy, however, proved a gainer by these misfortunes of the *Milanese* ; for *Leonardo*'s school being now broken up, the scholars spread themselves over the whole country. Several of them were persons of extraordinary abilities, and knew how to imitate their master so well, that people of moderate judgment have been sometimes at a loss to distinguish the copy from the original.

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He had made painters, carvers, architects, founders, and engravers in crystal and precious stones. Out of his school came *Francis Melzi*, *Cesar Sesto*, *Bernard Lovino*, *Andrew Salaino*, *Mark Uggioni*, *Anthony Boltraffio*, *Gobbo*, an extraordinary painter and carver; *Annibal Fontana*, a worker in marble and precious stones; *Bernazzano*, an excellent painter of landscapes; *Paul Lomazzo*, and several others. *Sesto* and *Lovino* were those who have had the greatest reputation; but *Lomazzo* would have surpassed them both, had he not unhappily lost his sight in the very flower of his age. Being thus disabled for the practice of painting, he applied himself to it in speculation; and, while he was blind, wrote several treatises, admired by the most clear-sighted; always appealing to *Leonardo* as a standard, and recommending him to all who would excel in painting, as a compleat model for their imitation.

In 1499, which was the year before duke *Lewis*'s defeat, *Leonardo* being at *Milan*, was desired by the principals of the place to contrive some new device for the entertainment of *Lewis* the 12th of *France*, who was then just ready to make his entry through that city. *Leonardo* consented, and accordingly made a very curious *automaton*: it was the figure

* of

of a lion, whose inside was so well furnished with machinery, that it marched out to meet the king, made a stand when it came before him, reared up on it's hinder legs, and opening it's breast, presented a scutcheon with *flower de lutes* quartered on it. *Lomazzo* is mistaken when he says that this *machine* was made for *Francis the First*, that prince having never been at *Milan*, till the year 1515, at which time *Leonardo* was at *Rome*.

The disorders of *Lombardy*, and the misfortunes of his ancient patrons the *Sforzi*, obliging *Leonardo* to quit *Milan*, he retired to *Florence*. That city enjoyed all the calmness and tranquillity necessary for the polite arts to flourish under. The magnificence of the *Medici*, and the good taste of the principal inhabitants, were powerful attractives, and prevailed more upon *Leonardo* to settle there, than the love he bore to it as the place of his nativity: The first thing he undertook here, was the design of an altar-piece for the annunciate. In this he represented the little *Jesus* with his mother, *St. Anne*, and *St. John*. *Leonardo* rendered himself extremely popular among his countrymen by this performance, which was seen and applauded by the whole city. Some years after this, he carried it with him into *France*, where,

at

at the desire of *Francis the First*, he put it in colours. But the piece he took the greatest pleasure in, and on which he bestowed the most pains, was the picture of *Lisa*, commonly called *la Joconde*. This was a divine piece: *Francis the First* was so charmed with it, that he purchased it at the price of 4000 crowns; and it is still to be seen in his successor's cabinet. This work cost *Leonardo* four entire years, and yet, after all, is said to have been left unfinished. While he was employed in painting this lady, he had musicians constantly attending; always playing upon instruments, or singing with their voices to divert her, and to prevent her from shewing a certain indolence and melancholy, which people out of action are extremely liable to. *Leonardo* about the same time painted two other very valuable pictures; the one a nobleman of *Mantua*, and the other a daughter of *Americus Benci*, much admired in those days for her incomparable beauty. Nor must we omit a *Flora*, which he finished about this time, and which is still to be seen at *Paris*. The figure has an uncommon grace and sweetnes in it's air; and might have been reckoned a master-piece, had it come from any other hand than *Leonardo's*.

In the year 1503, the *Florentines* re-
D solving

solving to have their council chamber painted, *Leonardo*, by a public decree, was elected to that office. He had already made a considerable progress in one side of the chamber, when he had the mortification to find that his colours did not stick, but that as fast as they dried they loosened from the wall. *Michael Angelo*, in concurrence with *Leonardo*, painted another side of the room. *Michael*, though he was but a young man, yet was become a very able painter, and had already acquired a mighty reputation; insomuch, that at 29 years of age he was not afraid to vie with *Vinci*, who was 60. Each had his friends and partizans, who, far from bringing them to a better understanding, helped the more to embitter them against each other; so that *Michael* and *Leonardo* commenced open enemies.

About this time *Raphael* coming fresh out of *Perugino*'s school, was led, by *Leonardo*'s reputation, to *Florence*. The first view of *Vinci*'s works struck him with astonishment, and wrought a reformation in him, to which all the glory he has since acquired, may justly be ascribed. He began now to look upon the dry, harsh manner of his old master *Perugino* with contempt; and to set before him the tenderness and delicacy of *Leonardo* for his imitation; and with

with such incredible vigour, as well as success, did he follow his new master, that he arrived by degrees at the utmost pinnacle of his art; and to this day, for the softness and sweetness of his figures, reigns absolute and without a rival.

Leonardo kept close at *Florence* till the year 1513. The most considerable of his works at that time, were a piece representing the virgin, with her little son; and a Baptist's head: the one now in the hands of the *Botti*, and the other in those of *Camillo Albizzi*.

Leonardo having never yet seen *Rome*, resolved now to make the tour of that city. The exaltation of *Leo X.* to the *Pontificate*, gave him an occasion of paying his respects to the new Pope; and he had there met with a countenance and esteem suitable to his merit, but for an unlucky adventure. *Leo*, who had an hereditary love for painting, and the polite arts, resolved to employ him. *Leonardo* hereupon sets himself to the distilling of oils, and the preparing of varnish, to cover his paintings withal: of which the Pope being informed, said pertly enough, that he could expect nothing from a man who thought of finishing his works before he had begun them. *Vasari*, a zealous adherent to *Michael Angelo*, assures us, that *Leonardo* met with many other

mortifications while he was at *Rome*; and relates some other little stories of him, which are the less to be credited, because they appear infinitely beneath a person of *Leonardo's* genius, and were never told but by a professed enemy.

Leonardo soon grew weary of *Rome*, and having an invitation from *Francis* the First, he removed into *France*. He was above seventy years old when he undertook this voyage; but the honour of serving so great a king, supported him, and seemed to give him new strength. In effect, the *French* proved as favourable to him, as the *Romans* had been injurious; and he found enough in the goodness of king *Francis*, to make him amends for any affronts he had met with at *Rome*. The court was at *Fontainebleau*, when *Leonardo* first presented himself before the king. *Francis* received him in the most affectionate manner, and shewed him all the marks of esteem and veneration which he could any way express. He was highly pleased to find the first painter in the world at his court, though, by reason of his age, he had but little to expect from him. The fatigues of his voyage, and the change of the climate, in all probability, contributed to the distemper of which he died. He languished several months at *Fontainebleau*; during which time, the king went frequently

quently to see him. This prince making him a visit one day, *Leonardo*, to shew his sense of the favour, raised himself on his bed: at that instant he was seized with a fainting fit, and *Francis* stooping to support him, he expired in the monarch's arms.

Leonardo died at the age of seventy-five years, extremely regretted by all who loved the polite arts, and honoured with the friendship and esteem of a mighty king. Nature, perhaps, was never more lavish, than in the composure of this great man, for she gave him even all that she had. He was extremely handsome and well shaped, his strength was surprising, and he acquitted himself with uncommon applause in all exercises of the body. But the talents of his mind were still more extraordinary than those of his person. He joined to a polite behaviour, the greatest strength and elevation of mind;—a surprising vivacity to an unwearied application to study;—a good stock of learning, to a pleasing conversation. He refrained from marriage, that he might work with the more freedom; on which occasion, one of his friends said, that *Leonardo* would marry no mistress but painting, nor beget any children but the works he performed. In his riper years, he indulged

dulged a philosophical negligence, letting his hair and his beard grow; insomuch, that at length he appeared like an ancient druid, or a modern religious in a desert.

Some of *Leonardo*'s paintings are to be seen in *England* and other countries, but the greatest part of them are in *Florence* and *France*. Besides those we have mentioned, *Lomazzo* informs us, that he painted the conception of the blessed *Virgin*, for the church of *St. Francis* at *Milan*. There are several other pieces in *Paris*, that are known assuredly to be his; as the holy *Virgin* sitting in *St. Ann*'s lap, and holding her little Son. An *Herodiade*, of exquisite beauty, some time in the cardinal *de Richlieu*'s possession. Another *Virgin* with her Son. *St. John* and an angel, a very valuable piece. *St. John* in the wilderness. A *Virgin*, much esteemed, heretofore in the hands of the marquis *de Sourdis*. *M. de Charmois*, secretary to the duke of *Schomberg*, had another very noble piece of *Leonardo*'s, representing *Joseph* struggling to disengage himself from *Potiphar*'s wife; the sweetness and modesty of the one, and the beautiful assurance of the other, were admirably expressed, and raised all those different emotions in the mind, which a view of the real transaction would have done.

As

As to the discourses *Leonardo* had composed, and the draughts he had made, those into whose hands they are fallen, preferring their private interests before those of the public, still keep them in obscurity. After *Leonardo*'s death, they were digested into thirteen volumes, all written backwards, after the *Hebrew* manner, and in so very small a character, that the naked eye was at a loss to distinguish one letter from another:—a contrivance, no doubt, of the author, to secure them from becoming too common. The fate of these precious remains has been as follows:—

Lelio Gavardi d' Asola, provost of St. *Zeno* in *Pavia*, and a near relation of *Althus Manutius*, had the care of instructing *Mess. Melzi* in the sciences. This gave him frequent occasions of going to their country seat at *Vaverola*, where the fore-said thirteen volumes of *Leonardo*'s works were preserved. *Gavardi* spying the books, begged them of his pupils, obtained his request, and carried them with him to *Florence*, hoping to make a round sum of money, by selling them to the great Duke. He was disappointed, however, for he found the duke on his death bed when he arrived there. Upon this he leaves *Florence*, and betakes himself to *Pisa*. It was there his fortune to meet with *Ambrose Mazzenta*,

Mazzenta, a gentleman of *Milan*; who ex-
postulating the case with him, laid before
him the baseness of taking the papers out
of the *Melzi*'s hands, who knew so little
of their value. *Gavardi* was so touched
with what he heard, that, without more
ado, he returns the books to *Horatio Mel-
zi*, then head of that family; and *Horatio*,
to reward the care and friendship which
Mazzenta had shewn, in procuring their
restitution, gives them back to *Mazzenta*.
This gentleman taking all occasions of ex-
tolling *Horatio*'s bounty, and expressing his
own gratitude, the matter came at length
to the ear of *Pompeio Leoni*, statuary to the
king of *Spain*. *Melzi* was soon made to
know the value of the papers he had so
frankly given away; and being promised a
considerable post in the *Milaneze*, if he
would recover them from *Mazzenta*, and
present them to the king of *Spain*, he hies
to *Milan*; where, with much intreaty, he
prevailed so far upon *Mazzenta*, that seven
of the thirteen volumes were delivered him
back again. Of the remaining six, cardi-
nal *Borromeo* had one, now in the *Ambro-
sian* library; *Ambrose Figgini* had ano-
ther, since descended to his heir *Hercules
Bianchi*; the duke of *Savoy*, *Charles
Emanuel*, had a third; and the other three
fell to *Pompeio Leoni*, and have been since
sold

sold by his heir *Cleodore Calchi*, to Sig. *Galeas Lonato*.

Leonardo's papers consisted of draughts and discourses; the latter, so many of them at least, as we have any knowledge of, are as follow:

A Treatise of the Nature, *Equilibrium*, and Motion of Water. This work contains many draughts of machines for conveying, raising, and supporting of water; being written on occasion of the aqueduct at *Mortefana*.

A Treatise of Anatomy, already mentioned. This work was likewise embellished with a great number of draughts, all carefully done after the life.

The Anatomy of a Horse, mentioned by *Vasari*, *Borghini*, and *Lomazzo*. The author had a particular talent at drawing of those animals; and designed this treatise for the use of those, who paint battles or triumphs.

A Treatise of Perspective, divided into several books. Leonardo, in this piece, delivers the method of drawing figures larger than the life, so much commended by *Lomazzo*, Chap. iv.

A Treatise of Light and Shadows, now in the *Ambrofian Library*, at *Milan*. It is in a folio volume, covered with red velvet, and was presented by Sig. *Mazzenta*

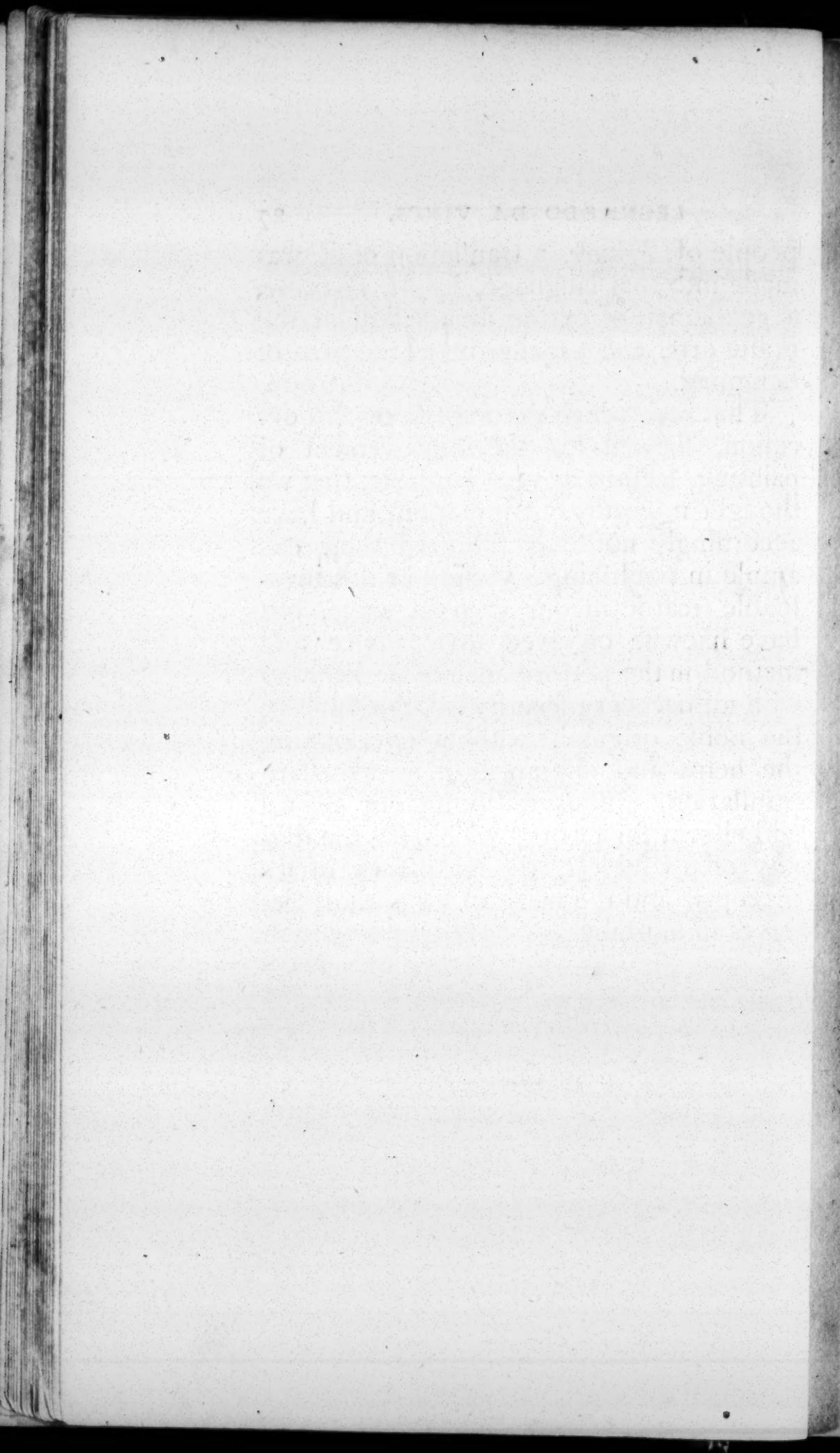
to cardinal *Borromeo*. *Leonardo* here handles his subject as a philosopher, a mathematician, and a painter; and makes mention of this work, in this Treatise of Painting. This must undoubtedly be an excellent performance; for *Leonardo* was admirable in that part of painting: he perfectly understood the effects of light and colours, and managed them with so much advantage, that his paintings discover something of truth and nature, beyond what is to be found in the works of any other master.

In his Treatise of Painting, *Leonardo* promises two other works. The one on the motion, and the other on the *equilibrium* of bodies.

The last of *Leonardo*'s treatises which we shall mention, is that which we here offer to the reader, upon Painting. *Vasari* informs us, that a painter of *Milan* travelling through *Florence*, shewed him this work, and promised him to get it printed at *Rome*; but he failed of his word, and left the honour of first publishing this inimitable piece to the *French*. It was in the year 1651, that an *Italian* edition of it appeared in *Paris*; all imaginable care having been first taken to send it into the world both correct and compleat. And to render the book still more familiar to the people

people of *France*, a translation of it was made into that language, by *M. Chambre*, a gentleman of extraordinary skill in the polite arts, and a master in all the parts of designing.

That zeal, which the *French*, on this occasion, shewed for the improvement of painting, seemed so very laudable, that we thought it worthy our imitation; and have accordingly not only followed their example in publishing a version of this invaluable treatise in our own language, but have likewise observed their advice and method in the performance of it; keeping with all necessary severity to the sense of the noble original, without overlooking the helps and assistances of an excellent translation. Thus testifying our regard and esteem for a work, which, for the dignity of it's subject, the excellency of it's precepts, and the merit of it's author, deserves immortality.



A

T R E A T I S E
O F
P A I N T I N G,

B Y

LEONARDO DA VINCI.

W H O E V E R would apply himself to painting, must, in the first place, learn perspective: this will enable him to dispose things in their proper places, and to give the due dimensions to each. Having done this, he must learn to design; * choosing for that purpose some able master, who, at the same time, may give him an insight into the *contours* † of figures. He ought then to consult nature, to confirm himself in what he has already learnt;

The first thing
to be learned by
a novice in
painting.

* To draw.

† The out-lines describing any body: the French say,
Contourner une figure.

and,

and, lastly, let him apply himself to the study and imitation of the greatest masters, in order to get a habit of reducing what he has learnt into practice.

In what a painter ought principally to exercise himself.

To design well, and to dispose the lights and shadows of figures suitably to their situations, being the most considerable parts of this art, and those on which the greatest stress depends; it is in these that a painter, who would make any great proficiency, ought principally to exercise himself.

The order to be observed in teaching a novice to design.

Of all animal operations we plainly perceive sight to be the most quick: it moves with incredible velocity, and discovers a thousand objects in an instant. But then it sees them very confusedly, and in effect does not discern above one at a time. For instance, if you glance your eye over a page of this book, you will immediately perceive it full of different characters; but what these characters are, or what is intended by them, will be still a secret: insomuch that, to gain any determinate knowledge of what you have seen, you must consider them piece-meal, forming the letters into words, and those again into periods. So a man who would mount to the top of a building, is content to go up step by step, as knowing it impossible otherwise to reach it. In the same manner, a person who would attain to a skill in painting, must begin with the parts of objects, ere he can proceed to represent them entire; and must take them in order, never advancing to a second, till he has got a good habit of doing the first: for otherwise, his time will be thrown away, or at least his advances rendered extremely slow and imperceptible. He must further inure himself

self to work with patience and steadiness, always remembering that a slow diligence will outstrip a hasty negligence.

Some people have a fancy for painting, who yet want the necessary dispositions thereto. This is easily discoverable in children, who amuse themselves with drawing imperfect sketches, never troubling themselves to shadow any thing they undertake.

A painter deserves but a small share of reputation, who only succeeds in some one branch of his art; as for instance, in painting a *nudity*,* a head, drapery, animals, landscapes, &c. since the heaviest genius, by incessant plodding on the same thing, cannot fail, at length, of performing it well.

A painter must therefore be universal, and apply himself to the study and consideration of all objects; but so as to attend, in a particular manner, to those parts of each, which are the most beautiful and perfect. By this means his imagination will become like a mirror, representing every thing laid before it, in it's proper character and colours.

But further, a painter who is not equally pleased with all parts of his art, will never become universal. My friend *Boticello*, for instance, had a particular pique against landscapes, and thought them much beneath his application; the effect of which was, that being a very sorry landscape painter, his merit in other matters was the less regarded. It was a saying of his, that a pallet full of colours being thrown against the wall, would leave a stain behind it

An inclination
not always at-
tended with a
genius to paint-
ing.

A painter to be
universal.

How a painter
may become
universal.

* A naked figure, either of a man or woman; especially the latter.

properly enough representing a landskip. It is true, indeed, that by help of a strong fancy, one may spy heads, battles, rocks, seas, clouds, woods, &c. in a wall so smeared; it being here, as in the ringing of bells, where every body is at liberty to make them say what he pleases: but then, though such a fortuitous mixture of colours may start a hint, or give rise to a new invention, yet will it not furnish the least assistance towards the execution, or finishing any thing it has occasioned.

A painter who would appear universal, and please people of different tastes, must set off several figures in the same piece, both with very deep and very soft shadows; taking care, by the way, to make the reason of such diversity apparent.

A painter ought to have his mind continually at work, and to make remarks on every object, worthy of notice, that he meets. He ought even to stand still in order to view them with the greater attention; and afterwards to form rules on what he has observed, with regard to lights, shadows, place, and other circumstances. Let him make himself a master of the theory, before he meddle with the practice, and be very curious in comparing the limbs and *jouctures* of different animals with one another; taking minutes of every thing he learns, the better to fix them in his memory.

A painter who has no doubts in his studies, makes but a small progress in his art; it being an infallible sign, where all things appear easy, that the workman is insufficient, and the work above his pitch. But when once a painter has got a just sense of the whole difficulties of his work, every new reflection he makes, will give him

The course a
painter must
take in his stu-
dies.

How a painter
may judge of
his proficiency.

him new strength to surmount them; insomuch that, if he perseveres in it, every day will contribute something towards his improvement and perfection.

Let a novice, in the first place, exercise his hand, in copying the designs of some able master; after he has got a habit of doing this, he may proceed to *relievo's*, designing after them, in the method hereafter to be taught.

The first sketch of a history piece must be very slight, and the figures very imperfectly formed; your principal regard being to the justness of their situation: having adjusted the *ordonnance** of the piece, you may finish the members at your leisure.

Whenever either your own reflection, or the information of your friends, points out any fault in your work, correct it immediately; lest, in exposing the piece to the world, you expose your own weakness: nor flatter yourself that what reputation you lose by letting it escape, may be retrieved in your next performance. It is not with painting as with music, which dies in the breath that gives it birth: painting is of a more durable nature, and whatever oversights of this kind you make public, will be standing reproaches to you ever afterwards. Nor will it avail to plead poverty in excuse of your errors, or to palliate the matter by urging want of leisure to finish what you do. The study of virtue itself will serve for food to the body, as well as the mind. How

The manner of learning to design.

How to sketch out a history-piece.

Faults to be corrected as soon as discovered.

* *Ordonnance* is the placing, regularly, the figures, in respect of the whole composition; or the particular disposition of figures, as to the different groups, masses, contrasts, decorum, aspect, and situation.

many philosophers born in the midst of plenty, have yet abandoned themselves to penury and want, to become the more free and disengaged for virtue, and the study thereof.

A painter never
to trust his own
judgment.

Nothing deceives us more than the judgment we form of our own works ; nor are the opinions of our friends much more to be relied upon : a friend is in effect a second self, and therefore to be held in the same degree of suspicion. It is the critique of our enemies that we ought to form ourselves by : this is usually sincere ; which is more than I can say either for myself, or my friend.

A new art of
invention.

Among other things, I shall not scruple to deliver a new method of assisting the invention ; which, though trifling in appearance, may yet be of considerable service, in opening the mind, and putting it upon the scent of new thoughts ; and it is this ; if you look at some old wall covered with dirt, or the odd appearance of some streaked stones, you may discover several things like landscapes, battles, clouds, uncommon *attitudes*,* humorous faces, draperies, &c. Out of this confused mass of objects, the mind will be furnished with abundance of designs and subjects, perfectly new.

The advantage
of recollecting
in the night,
what has been
studied in the
day.

I have often found it of use, to recollect the ideas of what I had considered in the day, after I was retired to bed, and encompassed with the silence and obscurity of the night. For, by thus repeating the *contours*, and other parts of figures, which require a closer attention, their

* *Attitude* implies little more than action and posture ; though it is sometimes used where neither of these would be proper : for instance, action is not applicable to a dead corpse ; nor do we say, that such a figure is in a handsome posture, but in a graceful attitude, or disposition.

images are strongly impressed on the memory, and familiarized to the mind.

If you intend to become a proficient, be sure never to *design* any thing slightly or in haste; but take time to consider, with regard to lights, which parts receive the strongest, and in shadows which are the deepest; observe how these mingle together, and in what quantity, still comparing the one with the other. As to the *contours*, consider towards what part they are to be directed, what quantity of light and shadow meet within the lines, where they are more or less strong, larger or smaller; and lastly, take care that your lights and shadows do not terminate abruptly, but that they fall softly into one another, and at last lose themselves, insensibly, like smoke. After you have once habituated yourself to be thus punctual and exact in your *designs*, expedition and dispatch will come apace.

While a painter is employed either in designing, or painting, he ought to listen with attention to the different sentiments which different people entertain of his performance: there being nobody, how ignorant in painting soever, but who understands the shape of a man, and can readily tell whether he be hump-backed, crooked-legged, have any thing monstrous in his hand, or any the like blemish: why may not a person then, who can so well distinguish the defects of nature, be allowed to judge of those of art?

It is ridiculous in a painter to confide so far in his memory, as to think it capable of retaining all he has seen and observed in nature: the memory is a faculty too weak, as well as too narrow, for that purpose; and the only

A man to go through a course of labour and industry ere he can attain to do things with ease and expedition.

A painter to covet the censures of different persons on his works.

A painter to design after nature, rather than his own ideas.

sure way, is to copy, as much as possible, from nature herself.

Variety of proportions to be affected.

A painter loses a great deal of his dignity, by confining his genius, and never venturing out of his ordinary course. There are some, for instance, who apply themselves to the painting of *nudities*; but so, as still strictly to observe the same proportions, and never introducing the least variety: whereas they should consider, that a man may be well proportioned, whether he be thick or slender, short or tall. By disregarding this diversity of proportions, a painter seems to cast all his figures in the same mould, which is an error of the first magnitude.

No difficult matter to become universal.

A painter, well acquainted with the theory of his art, may, without any great difficulty, render himself universal. For all terrestrial animals have this in common with each other, that their members are composed of muscles, nerves, and bones: the only difference between them lying in their different lengths and thicknesses, as is demonstrated by the anatomists. As to aquatic animals, in which, indeed, there is a great variety, I think a painter, who is well advised, will not trouble himself about them.

The absurdity of meddling with the practice, before having mastered the theory.

Those who venture on the practice, without first qualifying themselves in the theory, are like mariners putting out to sea without either helm or compass, ignorant what course to take. The practice ought always to be built on a rational theory, of which perspective is both the guide and the gate; and, without which, it is impossible to succeed, either in designing, or in any of the arts depending thereon.

A painter

A painter should never tye himself to imitate the *manner** of any other; his businesb being not to represent the works of men, but those of nature; who at the same time is so abundant in her productions, that it is ridiculous to have recourse to her servants, who have nothing but what they borrowed from her; when the mistress herself is so ready to entertain them.

To *design* after nature, or the life, you must be removed from the object, three times it's magnitude; taking care, as you draw each stroke, to observe what parts of your *model*† meet under the principal, or perpendicular line.

In *designing*, you must consider that the shadows of objects are not always simple; but that, besides the principal one, there are several others, thrown like smoke or a thin cloud upon the principal shadow, and for that reason almost imperceptible. This may be seen by experience; and the reason of it shewn by perspective, which demonstrates, that spherical bodies receive as many different lights and shadows as there are different bodies encompassing them.

* *Manner* is the habitude that painters have acquired, not only in the management of the pencil, but also in the three principal parts of painting, viz. invention, design, and colouring: it is by the manner in painting, that we judge this piece to be *Titian's*, *Tintoret's*, or *Vinci's* hand; as by the style in writing, we guess this book to be this or that author's.

† The *model* is generally taken for any natural object that presents itself to be drawn; in particular, it signifies a statue, nudity, or the like, set up in the academies, to be copied by the novices in painting.

The light proper to design by.

A north light will be the most proper for a painter's purpose, as being the steadiest. If his chamber be open towards the south, it will be convenient to place an oiled sash before it; to the end that the light of the sun, which will be upon it all day, being moderated, may spread itself equally, and without any sensible alteration. The light, by which he designs from the life, ought to come from such an altitude, as that the shadows of bodies projected on the plane, may be equal to their heights.

In representing of bodies, you must always give them such lights, as are most suitable to the places they are supposed to be in. For instance, if they be supposed in the country, and in the open air, the sun being hidden, they ought to be encompassed with an almost universal light; if the sun be seen, the shadows must be very dark with respect to the other parts which receive the light; and all the shadows, both primitive and derivative, must have their extremities bold and defined: the light accompanying these shadows, must be extremely faint; because the air, to whose reflection they owe that little light they receive, communicates at the same time it's own colour; weakening the light it conveys, by mingling it's own azure along with it. This is easily observable in white objects; such parts of which, as are illumined by the sun, plainly appearing tinged with the colour of that luminary; but discovers itself still more evidently, when the sun, hidden behind a cloud, illuminates it with his rays, and makes it appear red and inflamed: for then all bodies, receiving light from the cloud, will be tinged and coloured with it's redness; while the other sides of the bodies,

The lights proper for figures designed after the life, or after reliefs.

bodies, turned from the cloud, will appear obscure, and tinged with the azure of the air; so that a person, observing this object thus differently illustrated, will imagine it of two colours. It is a certain maxim then, founded upon what we know of nature, and the cause of these lights and shadows, that, to represent them aright, they must participate of that which produced them; and that, unless we make them retain something of their first cause, our imitation of nature will be lame and imperfect. But if the object you represent be supposed in a chamber a little illumined; and that you view it from without, standing in a line with the light that breaks in upon it, the shadows of that figure must of necessity be very soft, and the figure cannot fail of being very graceful, and of doing credit to the painter; for the *relievo* * will be bold, notwithstanding the softness of the shadows; and these will be the more eminently so on that side of the chamber which is the most enlightened, the shadows there being almost insensible: the reason of which shall be delivered hereafter.

Where the light is too harshly cut by the shadows, it has a very ill effect: to exade which inconvenience, it will be necessary, where your figures are supposed in the open air, to avoid placing them in the sun-shine; rather feigning a lowering day, and drawing a few transparent clouds between the sun and your figures: by this means they will be the more

The lights proper for figures designed from the life.

* The *relievo* is an embossed figure in sculpture; in painting it is used for that part which comes boldly out, as if it were really embossed.

weakly enlightened, and there will be room for the extremities of their shadows to mingle and lose themselves insensibly in the lights.

How to design
a nudity.

In designing a *nudity*, observe first to give your figure it's entire *contour*; afterwards chusing that part of it which you think best, and giving it a just proportion to the rest, proceed to finish it; for without this method you will never be able to join the several members together with the symmetry required: lastly, to add a still further grace to your figure, observe that the head be never turned the same way with the stomach; that the arm and leg have never the same direction; that if the head be turned towards the right shoulder, it be made to stoop a little on the left side; that if the stomach strut forwards, the head may be turned to the left side, and the parts of the right side represented higher than those of the left.

How to design
from the life.

A person who would *design* from the life, ought to place himself in such a manner, as that his eye may be in a level with that of the figure he is to copy from.

How to design
a landscape from
the life, or to
make an exact
plan of a
country.

Take a square piece of glass, about the size of a quarter of a sheet of royal paper, and fixing it directly between your eyes, and the objects you would design, remove yourself two-thirds of your arm's-length, that is, about a foot and a half backwards. Having then fixed your head, by means of some contrivance, so firm as not to move or shake a jot, shut one of your eyes, and with the point of a pencil, trace every thing upon the glass, that you see through it. When your eyes are at liberty, you may transfer this *design* from the glass upon

upon paper, and chalking the paper, make a fair copy from it, to be put into colours at your leisure; but be sure to observe the aerial perspective.

Landskips ought to be painted in such manner, as that the trees may appear half enlightened and half shadowed. The best time you can choose for this purpose, is when the sun is half covered with clouds; for then the trees receive, on the one hand, an universal light from the heavens, and on the other, an universal shadow from the earth; and their parts will be so much the darker, as they are nearer the earth.

When you have no other light to work by, but that of a candle, observe to place between the light, and the figure you would copy, a lawn frarne, or an oiled paper, or at least a piece of plain paper unoiled, provided it be very fine and thin; the shadows being by this means softened, their extremities will not appear too abrupt and cut off.

Lights and shadows add a surprizing grace to the faces of persons placed at the entrance of a dark room; every body who sees them will be charmed, provided they be well disposed; and so as that the shadowed side of the face may appear obscured by the darkness of the place towards which it is turned; and at the same time the lightened side be further illumined by the brightness of the air, which is diffused all over it, and by which means the shadows become almost insensible on that side. This augmentation of light and shadow gives figures a great *relievo*, and an uncommon beauty.

The light proper for a landskip.

How to design by candle light.

How in painting a head to give it all the advantage of light and shadow.

The light proper for faces, and all *carnations* in general to be painted by.

For faces and other *nudities*, you must have a chamber open and exposed to the air, whose walls are washed with a *carnation* * colour. The time you are to chuse for painting, is the summer, when the sun is covered with thin clouds; but if you fear lest it should break out, you may take care to have the south-wall of your chamber raised so high, as to be a screen to the northern one, and to prevent the sun-beams from striking upon it; otherwise the reflected rays will make false lights, and spoil your shadows.

The method to be taken in designing the figures in a history-piece.

A painter must always consider the place his painting is to be disposed in, and remark the height of the plan in which he intends his figures to be placed; observing, when he designs, that his sight be as much below the figure he is upon, as the place where the piece is to be exposed, is higher than the eye of a spectator. Without this precaution, his work will inevitably be full of faults, and can never possibly have a good effect.

How to design a *nudity*, or any other object from the life.

Hold a thread with a plummet suspended in your hand, and observe what parts meet in the same perpendicular line.

The measure or division of a statue.

Divide the head into twelve degrees, and each degree into twelve points, each point into twelve minutes, the minutes into seconds, and so on, till such time as you have found a measure equal to the smallest parts of your figure.

How a painter must place himself with regard to the light shining upon the model.

Let *A B* [Tab. I. Fig. I.] be a window through which the light enters, *M* the center of the light, and *C* the model: a painter may here place himself where he pleases, provided

* A flesh-colour.

his eye be between the shadowed, and the enlightened part of the *model*; which place he may find, by disposing himself between the point *M*, and that point of the *model* where it ceases to be enlightened, and begins to be shadowed.

A high light, equally diffused, and not too glittering, sets off objects with the utmost grace, and shews the smallest parts of them to the greatest advantage.

A painter who has any thing unseemly, or disproportionate in the make of his own person, will be extremely liable to bestow the same blemish on his figures: this is particularly observable in the hands, as being continually before our eyes. A painter therefore must apply himself to correct any false impression, which an object always present to him, may make on his imagination; and to guard against that ridiculous piece of self-love, of fansyng every thing beautiful that resembles himself.

A painter well acquainted with the muscles, tendons, &c. will know what, and how many muscles concur to the motion of any member; what muscle contracting itself, occasions any other to retire; what tendons and what ligaments belong to each muscle, and conspire to make it act; and will look with contempt on the manner of some ignorant painters, who, in all sorts of *attitudes*, do always make the same muscles appear, in the arms, back, stomach, and other parts.

It is a very gross, though a very common fault, to repeat the same *attitudes*, and the same folds of the *drapery*, in the same painting; and to draw all the faces so like one another, that they all appear design'd after the same *model*.

The light in which objects appear with the most advantage.

A painter's judgment sometimes imposed upon by the defects of his own person.

Anatomy necessary for a painter.

How a painter
may secure
himself from
being abused in
the choice of
his model.

A painter in the first place ought to design his figure from the *model* of some natural body, the proportions of which are allowed to be just and beautiful; let him in the next place measure himself, and observe in what part of his person he differs from his *model*, and how much that difference is. Having once determined these points, let him carefully avoid those faults in his figures, which he has discovered in his own person. A painter can never be too circumspect on this head; for as there is no object nearer, or more familiar to us than our own body, the defects of that do usually pass unregarded: sometimes we are even fond of them, and not only view them with delight in ourselves, but in others too; it being a natural passion of the soul, to take pleasure in things resembling the body it animates. It is for this reason, perhaps, that there is no woman, how disagreeable soever she be, but who finds her gallant.

A fault of some
painters, who
introduce a fi-
gure designed
for one light,
into a piece
supposed to be
enlightened by
another.

A painter who had *designed* some particular figure, with strong lights and shadows, shall frequently, either through ignorance or inadvertency, introduce it into a piece, the *scene* of which lies in the country, and demands a light equally diffused on all sides, and which shews all parts of the object. By this means it comes to pass, that, contrary to the established rules of the *clair-obscur*,* we often see deep shadows, where there can be none in nature, or at least where they are almost insen-

* *Clair-obscur*, by the *Italians* called *chiaro-oscuro*, is the art of managing lights and shadows: so when a painter chuses an advantageous light, and disposes his figures so, as that they receive the lights which are set off with deep shades, he is said to understand the *clair-obscur*.

ible; and *reflexes*,* where there cannot possibly be any at all.

Painting consists of two principal parts; the one is the *design*, that is, the figure, or *contour*, bounding bodies, and their parts:—the other is the *colouring*, comprehending the colours included within the *contour*.

Designing is likewise divided into two parts; one whereof is the proportion of the parts, with regard both to one another, and to the whole which they constitute:—the other is the *attitude*, which ought to be proper to the subject, and to correspond with the intention, and the sentiments supposed to be in the figure represented.

There are three things to be considered in the proportions, *viz.* justness, suitableness, and motion. Justness takes in the exact measure of the parts, considered both with regard to one another, and to the whole. By suitableness, we mean the character proper to each person, according to it's age, state, and condition; so that in the same figure there be not seen parts both of an old man and a young one; nor those of a woman in the figure of a man; nor in a beautiful body, any other than beautiful parts. Lastly, the motion, which is nothing but the *attitude* and expression of the sentiments of the soul, requires a disposition in every figure, that may express what it is doing; and the manner it would do it in: for it must be observed, that an old man never appear with the briskness and vivacity of a

* *Reflex* is the return or rebound of the light, bringing with it a colour borrowed from the subject that sends it back.

young one, nor the force and vigour of a robust one; that a woman never have the air of a man; and, in short, that whatever either force or delicacy are shewn in the figure, be likewise seen in it's motion.

The motion
and expression
of figures.

All the figures in a painting ought to be in an *attitude* suitable to the subject they represent; so that, in viewing them, one may easily know what they think, and what they would say. To assist your imagination, in thus suiting the *attitudes* to your figures, consider attentively the gestures of mutes, who express the thoughts and conceptions of their mind, by the motions of their eyes, hands, and whole body. Nor must you be surprized that I send you to a master without a tongue, to learn an art of which he is ignorant himself; since experience makes it appear, that he will teach you more by his actions, than all the world besides, with their words and lectures. A painter therefore, before he fix his *attitudes*, should consider the quality of those who speak, together with the nature of the busines they speak on; in order to apply the example of a mute, which I here propose, to his purpose.

The contours
never to be too
harsh and appa-
rent.

Never draw the *contours* of your figures in any colour different from that of the ground they are in; that is, never make any obscure *profiles* * between the figures and the ground.

* *Profile* is that which marks out the parts, members, and jettings-out, &c. of solid bodies, and is opposed to the plan; as when we say the *profile* of a church, we mean the representation of it's height, depth, and length, &c. In sculpture it signifies a head drawn sideways, as in medals, &c.

The faults in little figures are not so easily discerned as those in larger; the reason of which is, that the extreme diminution of the parts of little figures does not allow us to examine strictly into their proportion: so that it is impossible to determine wherein those parts are defective. A fault not so easily discovered in a small thing, as a large one.

For instance, if you look at a man three hundred paces distant from you, with design to examine the features of his face, and to observe whether he be handsome or deformed, or of ordinary appearance; you will find that with how much earnestness and attention soever you view him, it will be impossible for you to discover to which class he belongs: the reason of which is, without doubt, owing to the apparent diminution of the parts of the object, occasioned by it's great distance from the eye. If you doubt whether distance diminishes objects, you may be easily convinced by the following experiment:—hold your hand at some distance from your face, in such manner, as that pointing up a finger, the tip of it may correspond to the top of the same person's head, whom you were before observing; and you will find that your finger does not only cover his face length-wise, but likewise a considerable part of his body: an evident proof of the apparent diminution of the object!

The painters are apt to lament themselves, and quarrel with their own performances, because, in copying from the life, they cannot give their figures the same force and *relievo*, with which images appear in a mirror; urging that they have colours of greater lustre, and shadows much deeper, than any the mirror exhibits; and laying the whole blame of their failure upon their own ignorance, or unhappiness.

Why the *relievo* in painting can never be so bold, as those in nature.

ness in the management of them: but they herein abuse themselves, and impute that to their own weakness, which is an effect purely natural. A painted figure must of necessity appear with less *relievo*, than a figure seen in a mirror, (though both superficial) unless both the one and the other be only viewed with a single eye; the reason is this:—the two eyes, *AB*, [Tab. 1. Fig. 2.] viewing the two objects, *NM*, one behind another, *M* cannot entirely intercept the sight of *N*, the base of the visual rays being so large, that the farther object discovers itself beyond the first; but if you only make use of one eye, as *S*, [Tab. 1. Fig. 3.] the object *F* will intercept the whole extent of *R*, because the pyramid of visual rays, issuing from a point, has the first body *F* for it's base; by which means the second *R*, of the same size, is entirely hidden.*

It is an universal fault, and which painters every day run into, in painting the fronts of churches and chapels, that, after finishing some history-piece, with the landscape, buildings, &c. they go on to paint other pieces, over, and by the side of the first, still changing the *perspective point*; so that the same front shall be painted with several different *points of view*;

Several history-pieces never to be painted one over another on the same front. *

Leonardo is a little obscure in this chapter, and may, perhaps, have been mistaken; the matter, in a few words, seems to be this: every painting is a piece of perspective, and the figures in it capable of appearing with as much *relievo*, as the natural objects they represent. But the figures in painting are all flat, so that we cannot turn round them, to view their different sides; there being properly but one point of view from whence they may be well seen; whereas we survey all the sides of natural bodies; and they always appear with the *relievo* they really have.

than which nothing can be more absurd; the *point of view* in any painting representing the eye of a spectator. If you ask then, how the life of any saint divided into several histories, may be painted on the same front? I answer, that you must place your first plan, with it's perspective point, at such a height as may be the most suitable to those who are to view it below; representing your principal history in large, upon this first plan, and still diminishing the figures and buildings for the rest of your subject, according to the different situations they are placed in. In the rest of the front towards the top, you may paint landscapes, with trees, proportionate to the figures, or angels, if the history require it, or birds, or barely the heavens with clouds, and the like incidents. Without this conduct, it will be much better for you to let these sorts of paintings alone; for your whole work will be false, and contrary to the rules of optics.

The figures illuminated with some particular light, shew a greater *relievo*, than those enlightened with an universal one. For a particular light produces *reflexes*, which loosen the figures from the ground of the painting. These *reflexes* rise from the lights of some figures, and rebound upon the shadows of those opposite to them, giving them a faint light. A figure, however, exposed to a particular light, in some vast obscure place, receives no *reflex*; so that there are no parts of it to be seen but what are enlightened: but this is never used excepting in *night-pieces*, where the light must be very dim and particular.

The light in
which figures
appear with
the greatest *re-
lievo*.

The *contours* of figures discover more skill in designing, than the lights and shadows: the

Greater varie-
ty in the
lights and

Shadows of figures, than in their *contours*.

first requires the greatest strength of thought, and the latter the greater extent and compass; for the members are confined to a certain number of motions; but the projections of shadows, the qualities of light, their degradations, &c. are infinite.

The muscles used in the several motions of the body, to be remembered by a painter.

Take notes of the muscles and tendons, which, in different *attitudes*, and different motions, are either discovered or hidden in each member, or at least, that are neither the one nor the other: and remember that this is a study of great importance to painters and statuaries, whose profession obliges them to understand the muscles, their functions and uses. But further, you must make these remarks on the human body, in all it's stages, from infancy to old age; observing the changes each member is liable to; for instance, in growing fatter or leaner, &c.

A remark upon expression and attitudes.

In actions purely natural, which we perform without reflection, but which, at the same time, spring from a strong inclination, a painter should observe what are the first effects discovering themselves in the body; and make sketches of what he remarks in this kind; for by means of these, he will be enabled, on occasion, to place a body in the same *attitude*; from whence he may gather, what parts are concerned in the action he would represent.

Painting only to be viewed from some single place.

Painting should only be viewed from one single place, as may be observed from the following example:—If you would represent a round bowl in any high place, you must give your figure an oval *contour*, retreating backwards till such time as it appear round.

A remark upon shadows.

When, in designing after any body, you find yourself unable precisely to determine how far the

the shadows reach; be sure to leave them unfinished in your painting. By this ingenuous piece of negligence, you will at once shew your own modesty, and the strictness wherewith you imitate nature.

Children that are to be represented sitting, must shew very quick motions, and even ^{How to represent little children.} contorsions of body; on the contrary, if they be standing, they should appear timorous and fearful.

To represent an old man standing, you must give him a dull indolent attitude, with slow motions, his knees a little bent, his feet straddling, his back crooked, his head stooping forwards, and his arms rather folded, than spread out too wide. ^{How to represent old men.}

Old women should appear eager and passionate, fiery and outrageous as furies: but this character ought to be expressed in the air of the face, and the agitation of the arms, rather than in the motions of the feet. ^{How to represent old women.}

Women must appear very modest and reserved in their air, their knees close together, their arms across, or folded over the stomach, the head gracefully bowing, and a little inclined on one side. ^{How to represent women.}

A thing wholly devoid of light, is nothing but darkness: now, the night being of this nature, to make any nocturnal representation, you must take care that there be a large fire, to illumine your objects; in the conduct of which, you must observe the following rules:—those things that are nearest the fire must be the most tinged with it's colour, it being a natural property of bodies, that the nearer they are to any object, the more they receive of it's light, and the more they partake ^{How to paint a night-piece.}

of it's colour; and as the fire appears of a red colour, every thing illuminated by it must likewise be seen of a reddish cast; this redness always growing weaker, and partaking more of the blackness of the night, in proportion as the objects are farther removed from the fire. As to the figures, observe that those between you and the fire do not appear in the least illuminated by it; for, on the side that you view them, they are only tinged with the obscurity of the night, there being no possibility of their receiving any thing from the brightness of the fire: the figures on either side should appear half red and half black; and those seen beyond the fire, must be all illuminated with a red light, upon a black *ground*. As to the *attitudes*, such figures as are nearest the fire should hold their hands before their faces, and screen themselves from the scorching heat of the fire with the skirts of their cloaths, turning their faces the other way, as if they were about to fly from it. Those that are further from the fire, should likewise appear dazzled with the flame, covering their eyes with their hands, to shelter them from the too-powerful light.

How to represent a tempest.

If you would represent a tempest, consider attentively it's effects. A high wind, either upon sea or land, forces up every thing it meets with, if not steadily fixed, tosses it confusedly, and whirls it away. In painting a tempest, therefore, you must represent the clouds driven impetuously by the wind, and clashing against each other; the air filled with dust and sand, swept from the shores, and gathered into eddies; leaves, and even branches of trees, disorderly blended with other light bodies,

bodies, and hurled with rapidity over the whole region; herbs beaten close to the ground; some trees torn up, their roots in the air; others giving way to the wind, their boughs broken, or bent contrary to their natural posture, their leaves ruffled, and folded in different manners; men overturned, incumbered in their cloaths, covered with dust, and scarce to be known; others, who keep upon their feet, appearing behind some tree, and clinging close round it, lest the storm should transport them; others covering their eyes with their hands, for fear of being blinded by the dust, bending towards the earth, with their drapery irregularly fluttering in the air, or even flying from them in the wind. If the storm be represented at sea, the waves dashing against each other, must cover it with froth, which being raised up by the wind, may fill the air as with a thick cloud; vessels appearing in the middle of the water, must discover sailors holding the ends of broken ropes, shattered sails wildly floating, and torn masts tumbled upon the deck: others may be represented upon the point of ship-wreck, the waves breaking in, the mariners shrieking and laying hold of the remaining wrecks of the vessel. One may further feign the air full of clouds, impetuously driven by the winds, stopped and repulsed by the mountain-tops, and having recollect ed themselves, encompassing them like waves broken against a rock; the day at the same time appearing dark and overshadowed with dust, rain, and thick clouds.

In the first place, you must paint the smoke of artillery, confusedly mingled in the air, with the dust arising from the horses' feet.

How to represent a battle.

In

In expressing this mixture, observe the following rules. Though dust, by reason of it's extreme lightness, does easily mount into the air, yet has it the common affection of all natural bodies, I mean gravity, by which it returns of itself towards the earth; none but the finest and most subtle parts of it continuing to float in the air: it must be painted therefore of a very thin weak colour, and not much unlike to that of air; the smoke which mingles itself with the air and dust, being mounted to a certain pitch, will appear like dark clouds; in the more elevated parts, it will be much more visible than the dust, and will appear of a colour somewhat azure and blueish; the dust always retaining it's natural colour. This mixture of air,* dust, and smoke, will appear much brighter on the side whence the light comes, than on the opposite one. The deeper the combatants are sunk in this cloud, the less visible they will be, and the less difference there will be between their lights and shadows. The faces, persons, airs, arms, and every thing about them, must be painted of a fiery red colour, this redness always diminishing as it is further removed from it's origin, and at last losing itself entirely. The figures far distant, between you and the light, must appear dark, upon a light

* The author's words are, *dalla parte che viene il lume parrà questa mistione d'aria, fumo, & polvere, molto più lucida che dalla opposta parte.* Which the French translator has taken the liberty to alter, turning them thus, *de mélange d'air, de fumée, & de poussière, sera beaucoup plus clair far le haut, que vers le bas;* i. e. this mixture of air, smoke, and dust, will be much clearer at the top, than towards the bottom. One of these two meanings, we hope, cannot fail to please the reader.

ground, their legs being always the least distinct and visible; because the nearer the earth, the thicker and grosser is the dust. If you represent any horsemen out of the main battle, remember to raise a little cloud of dust behind each of them, at the distance of each stretch of the horse; taking care that they weaken and disappear, as they become further removed from the horse that raised them; and observing that those which are the farthest distant, be the highest, spread the widest, and the thinnest; and those nearer, the lowest, densest, and most sensible. The air must appear full of trains of fire, darting like lightning, some upwards, some down, and others in a level with the earth. The balls discharged from fire-arms, must leave a train of smoke behind them; and the front figures must appear covered with dust, especially their eye-brows, and other parts apt to retain it. The conquerors must be represented running, with their hair scattered abroad, and both that, and their draperies blown about by the wind; their faces frowning, their eye-brows swelled, and drawn near one another; their members must make a *contrast* * among them, so that if the right foot step the foremost, the left arm must be advanced the furthest. If you represent any one fallen, let the blood, trickling from his wound, stain the dust; and let the wet earth all around be marked with the footsteps of men and horses: you may likewise paint the figures of

* *Contrast* signifies quarrel or opposition, and is used to denote the different aspects and positions, either of the parts of a figure, as in the place here referred to; or of the figures forming a group, or assemblage: as for instance, when one figure shews itself side-ways, another full before you, a third on the other side, &c. they make a contrast.

horses, dragging and tearing their dead masters hanging in the stirrups, and smearing the ground they pass over with blood. The vanquished must appear pale, and astonished, their eye-brows high, their foreheads full of wrinkles, their nostrils shrunk into an arch, and furrowed from the tip of the nose to the eyes; their mouths gaping, their lips turned back, discovering the teeth unclenched, and in a posture of shrieking and lamentation. Let some one, lying wounded on the ground, with terror and amazement in his looks, hold one hand before his eyes, the palm towards the enemy; with the other fixed on the earth, supporting his body: you may shew some turning their backs, and flying with open mouths. The field of battle must be covered with arms of all sorts, trampled under foot by the combatants; shattered helms, bucklers, broken swords, shivered lances, and the like. Among the slain may appear some half covered with dust, and broken weapons; others, as it were, quite buried under them: streams of blood must be seen issuing from the wounded, and flowing into the dust; and this mixture of blood and dust must cover the earth with a purple mire. Some may be represented in the pangs of death, grinding their teeth, rolling their eyes, clenching their fists, and making several contortions of body, arms, and legs: another may be seen disarmed, and thrown down by his enemy, yet still defending himself with his teeth and nails. A horse may be shewn broken loose, and running through the enemy, with his mane dispersed, and floating in the wind, beating down all he meets with: some one, wounded, may be seen tumbling to the

the ground, and covering himself with his buckler; his antagonist at the same time stooping over him to take away his life. There may be likewise represented a whole croud of men, confusedly spread under a dead horse; some of the conquerors may be shewn retiring out of battle, wiping their eyes clammed up with dust, and their cheeks smeared with filth, formed out of sweat and tears which the dust had made to trickle from their eyes. You may likewise represent squadrons advancing to succour their fellows, full of hope, mixed with circumspection; their eye-brows drawn up on high, shadowing their faces with their hands, the better to discern the enemy through the dust, and attentively waiting the commands of their leader. The general must be seen with his truncheon in his hand, ranging his troops, and pointing out what way each battalion is to move. A river may be represented, and horsemen seen plunging through it, dashing the water all around them, and raising a froth wherever they pass. Nothing, in fine, must be seen throughout the whole field of battle, but what is full of horror, blood, and carnage.

We all allow the air to be much grosser and more dense in some places than in others; and that, in proportion as it is higher from the earth, it is more subtil, pure, and transparent. For this reason, high objects, seen at a good distance, do not shew their under parts so clearly as the upper; the visual rays, by means of which we view the former, travelling through a long tract of thick foggy air: whereas the rays, by which we see the latter, though on the side of the eye they begin in a gross air, yet do they terminate in a much purer and refined

How to represent remote objects.

air on the side of the object: so that, in proportion as they remove farther from the eye, they become still finer; passing continually out of a pure air into a purer. In painting landscapes, therefore, a painter must observe to make his mountain-tops clearer than the bottoms; and even his hillocks rising over one another, must appear conformable to this rule: the farther they are removed, the clearer always must their tops be seen; and the higher they are raised, the more visible and distinct must their forms, and different colours, discover themselves.

The lower parts
of the air bright-
er than the up-
per.

That part of the air near our earth, being grosser than that at a greater distance, of consequence it must receive and reflect a greater share of light. This you may observe, by looking towards the west, when the sun is rising; for you will see a considerable brightness in that quarter, before any appearance of light be discoverable over your head. In painting a landscape, therefore, where the sight is supposed to be bounded with a large plain, the heavens must be represented brighter, in proportion as they appear near the earth; the lower part, at the same time, being seen whiter and more lucid than the higher, in the same proportion; because the rays of the light reflected from the former, pass through a larger track of gross white air than those from the latter, and of consequence must be more tinged with the whiteness thereof. But in looking towards the east, when the sun rises, the air appears more obscure, in proportion as it is lower; the sun-beams being scarce able to make their way through the gross vapoury air of the lower regions.

The

The figures of any body will appear loosened from the painting, and standing out with a great *relievo*, when the ground they are painted on is diversified with bright and obscure colours; the greatest variety possible appearing about the *contours* of the figures: but it must be observed, in distributing these colours, that a due regard be had to their *degradation*, that is, to the diminution of brightness in the white, and of obscurity in the dark ones.

In representing objects after their natural bigness, it must be observed, that the front figures in pieces of *miniature*, be equally finished and distinct with the larger ones in painting: but then the figures in miniature, being small, must be viewed very near, and those of painting at a much greater distance; by which means, how different soever they may be in their real dimensions, they ought to appear of the same bigness; the eye, in that case, viewing them, under equal angles, as may be thus demonstrated:—let *BC* be a painting, [Tab. I. Fig. 4.] *A* the eye, and *DE* a glass, through which the species of *BC* pass to the eye; I say that the eye *A* remaining fixed, the image of the painting *BC*, thrown upon the glass *DE*, will be smaller than the painting, in proportion as the glass is nearer to the eye, and will be equally finished and distinct with the painting itself; because it perfectly represents the painting at that distance. But if you would make a copy of *BC* upon *DE*; in that case, the painting, by reason of it's distance, appearing indistinct, the figure you make from it must not be equally finished and distinct with the painting; though, at the same time, it must be more distinct than another figure *MN*, made upon the glass *FG*:

How to give figures a great relieve, and make them appear standing out from the ground of the painting.

Of representing objects in their natural bigness.

for if the figure *PO* were as much finished as *BC*, the perspective of the former would be false; since, though with regard to the diminution of the figure, it would be right, *BC* being reduced to the extent *PO*, yet would it be too much finished for it's distance: so that, by finishing *PO* as much as *BC*, *BC* will appear at the nearness of *PO*; and, by diminishing *BC* to the compass *PO*, *PO* will appear at the distance *BC*.

What figures to be the most finished.

Things that are near, and that are represented in the front of a painting, must appear more distinct and finished than those supposed to be seen at a distance.

Take care that the colours of your figures be so matched, as that they may give a grace to each other; and when you make any one serve as a ground to another, let it be done in such a manner, as that they may not appear joined or fastened together, even though they be both of the same kind; but observing to make their *teinte* or lustre stronger or weaker, in proportion to the distance, and to the grossness of the air interposed between them: and, by the same rule, proportioning their *contours*; making them more or less bold and distinct, as the figures are nearer, or farther removed.

What light sets faces off with the most advantage.

The light, striking on the faces of persons placed between dark walls, makes them appear very graceful, and with a great *relievo*; especially if the light comes on them from on high. The reason of this *relievo* is, because the most forward and advanced parts of these faces are illuminated with the universal light of the air before them; so that the parts thus enlightened have shadows that are almost insensible; the parts farther removed, being, at the same time, shadowed

shadowed by the obscurity of the walls, and receiving still more of this shadow, as they are farther removed from the advanced parts, and deeper involved in the shade. Observe farther, that the light, coming from on high, does not illuminate all parts of the face, but that some are screened by the *relievo* of others; as the eye-brows keep the light from the hollow of the eye, the nose from part of the mouth, and the chin from the throat.

Reflexes of light proceed from clear transparent bodies, whose surfaces are polished and moderately dense; for a ray of light striking upon one of these bodies, rebounds like a ball, and reflects upon the first body that appears in it's course.

The surfaces of dense bodies are encompassed with lights and shadows of very different qualities. Of lights there are two kinds; the one original, the other borrowed. Original light is that inherent in any body, and which it does not receive from any other; as fire, the sun, and even the air; which last, however, though it be well stored with light, yet does it in effect receive it all from the sun. Borrowed light is reflected light; that which a body has not in itself, but receives from another. To come to the purpose them:—there can be no *reflex* of light from that side of a body on which it is shadowed; that is, from that side turned towards any dark body or place, as thickets, trees, shrubs, herbs, and the like; for though each leaf and branch receives the light towards which it is turned, yet does the great quantity of leaves and branches form an opake body, which the light cannot penetrate.

Reflexes

Of reflexes.

Reflexes will partake, more or less, of the colour of the object on which they are produced, and of the colour of that which produced them, as the object that receives them has a more or less polished surface, than that which produces them.

Of reflexes
thrown upon
shadows.

If the light illumining any body be reflected upon the shadows encompassing it, the reflexes formed thereby, will alleviate or enlighten the shadows, in proportion as their light is stronger or weaker, and as they are nearer or more remote from the body whence the light proceeds. This observation is made use of by some, and as much despised by others. The painters have even divided themselves into factions about it, each exposing and ridiculing the other. If you would keep a just mean, and secure yourself from the censure of either party, make the proper use of both opinions: observing never to make any *reflexes*, but where the necessity of those *reflexes*, and their colours, may be evident; nor ever omitting to make them, but where the reason of such omission may be easily perceived by every one.

Where reflexes
appear the most,
and where the
least.

The *reflexes* of light are more or less bright, that is, they are more or less apparent, in proportion as the ground, on which they are seen, is more or less obscure. When the ground is darker than the *reflex*, the latter will appear strong and sensible, the former serving as a foil to it: so where the *reflex* is found on a ground brighter than itself, it must of course appear the more dim, by reason of the whiteness surrounding it, becoming, by this means, almost imperceptible.

What part of a
reflex will be the
brightest.

The *reflex* will be the most bright and vivid in that part which receives it's light between the

the most equal angles: for example, suppose *N* the center of light, [Tab. I. Fig. 5.] and *A B* the enlightened part of the body *A B C F E D*, from whence the light is reflected all around the shadowed concavity of the same body; suppose likewise the light reflected on *E* to have been transmitted between equal angles, or angles nearly so: in this case the *reflex E* will not have angles so equal at the base, as the reflex *F*; as may be easily seen from the great inequality between the angles *E A B* and *E B A*: thus the point *F* will receive more light than the point *E*, and the *reflex F* will be brighter than the *reflex E*, since, though the angles *F* and *E* have the same base, yet the angles opposite to the point *F*, approach nearer to an equality, than those opposite to the point *E*. Further, the point *F*, by the rules of perspective, must be more enlightened than the point *E*, because it is nearer the luminous body *A B*, whence they receive their light.

The reflexes of a *carnation*,* receiving their light from some other *carnation*, will be of a redder, more vivid, and more vermillion colour, than any other part of the body: the reason is, because the surface of any opake body partakes more of the colour of the body from whence it has it's light, as that body is nearer it, and less as it is further removed: it likewise participates more or less of it, as the opake body is greater or smaller; because being large it intercepts the species of the adjacent bodies, and prevents them from mingling their colours

* By *carnation* is sometimes meant barely a colour; at other times it signifies a naked part of a figure, uncovered with the drapery.

with it's own ; which, were it small, would infallibly be the case. Sometimes, however, it happens that a *reflex* partakes more of the colour of a small body, that is near it, than of a larger more remote ; the effects of the latter being rendered less sensible, by reason of it's distance.

Where reflexes
are the most
sensible.

Of all reflexes, that which is seen on the darkest *ground*, must appear the boldest and most sensible ; and, on the contrary, that appearing on the brightest *ground*, the dimmest and least distinct : this arises from the *contrast* between things of different obscurities ; the least obscure of these serving to set off the others with the greater lustre, and the brighter to render the others still darker and less perceptible : just like two things of unequal whiteness, which when opposed to each other, the whitest casts a dimness and foil on the other, beyond what it had of itself.

Of double and
triple reflexes.

Double reflexes are more powerful than single ones, and the shadows interposed between the *incident* rays and these reflexes are scarcely sensible. A simple *reflex* is that which is formed by one enlightened body alone ; whereas a double *reflex* receives light from two, and a triple one from three. To come then to the proof of our proposition, let *A* be a luminous body, [Tab. 1. Fig. 6.] *A N* and *A S* direct reflexes, *N* and *S* parts illumined by *A*, *O* and *E* parts of the same bodies, illumined by the reflexes, *A N E* a simple *reflex*, and *A N O* and *A S O* a double *reflex* : the simple *reflex* *E* is formed by the enlightened body *B D*, and the double *reflex* *O* by the two enlightened bodies *B D* and *D R* ; hence the shadow of the double *reflex* will be very thin, and scarce perceptible, being found between the *incident* light and that of the *reflex* *N O S O*.

One body reflecting light upon another, does not communicate it's colour to that other body, such as it appears in itself; but tinges it with a mixture of several colours resulting from different parts of the first body, upon the same point of the second. For example, let *A* be a yellow colour, [Tab. 1. Fig. 7.] reflected upon the part *O* of the spherical surface *C O E*, and let the blue colour *B* have it's *reflex* upon the same point *O*; by the mixture of these two colours in *O*, the *reflex* will be converted into a green, if the ground be white; it appearing from experience, that blue and yellow mingled together do form a very beautiful green.

It seldom happens that a *reflex* is either of the colour of the body whence it proceeds, or of the colour of that upon which it falls; these two colours usually mingling themselves together, and out of the mixture forming a third. For instance, suppose the spherical body *D F G E*, be of a yellow colour, [Tab. 1. Fig. 8.] the object *B C* of a blue one, and let *H* be the point where a *reflex* sent from *C B*, strikes upon *D F G E*: the point *H* in this case will become green, when illumined by the light of the sun diffused in the air.

Among *reflexes* which have the same figure, force, and extent, that will shew itself with the greatest or least strength, which terminates on a *ground* the most or least obscure.

The surfaces of bodies partake more of the colours of objects, as their images are reflected upon them, under angles nearly equal. Of colours, reflected by objects upon opposite bodies, between equal angles, that will be the most vivid, whose *reflex* comes from the least distance. Among the colours of different objects,

The colour of a reflex seldom simple, but mixed out of several colours.

The colour of a reflex composed of the colour of the body whence it proceeds, and of that on which it falls.

In what place a reflex is the most vivid and sensible.

sending their *reflexes* from the same distance, and at the same angles, upon opposite bodies, that will be reflected with the greatest force, whose lustre is the strongest. The object reflecting it's colour with the greatest vigour upon an opposite body, is that which has no colour around it, but of it's own kind: and on the contrary, of all *reflexes*, that produced by the greatest number of objects of different colours, will be the most dim and confused.

The colour nearest any *reflex* will communicate more of it's tincture, than those at a greater distance.

Lastly, a painter must tinge the *reflexes* of his figures, with the colours of such parts of the *drapery*, as are nearest the *carnations* on which these *reflexes* are thrown; always observing that these reflected colours do not appear too vivid and distinct, unless where there is some particular reason for the contrary.

Of reflected colours.

All reflected colours are less vivid, and appear with less force, than those which receive their light directly; the direct or *incident* light bearing the same proportion to the light reflected, which the luminous bodies occasioning them, bear to one another in brightness and lustre. A *reflex* proceeding from a body more obscure than that which receives it, will be weak and almost insensible; on the contrary, where the *ground* on which it is received, is darker than the surface whence it proceeds, it will be bolder and more visible: lastly, it will be still more sensible as the *ground* is more obscure, and dimmer, as it is more bright.

Of the position of figures.

As much as the left side of the *nudity*, D A, is shortened on account of the position of the figure, so much the opposite side B C, is lengthened;

ened; that is, in proportion as that part of the figure between the left shoulder *D*, and the waist *A*, is diminished, the part on the opposite side, from *B* to *C*, is augmented; the navel, or the middle of the body, always continuing in the same height. This diminution of parts on the left side of the figure, arises from it's resting on the left foot, which by this means becomes the center of the whole body: hence it comes to pass, that the middle point, which is under the throat, between the two *clavicles*, quits the perpendicular in which it was found when the body was erect, and enters into another which passes through the left leg, and terminates in the left foot; and the farther this line deviates from the middle of the body, the farther likewise will the horizontal lines which traverse it, recede from right angles; still declining towards the left side, on which the body rests.

When you understand perspective and anatomy well, and have a tolerable notion of the parts and members of bodies, take all occasions of observing the different *attitudes* and gestures of men, in different actions. For example, in your walks, when the mind is free and disengaged, observe the motion of those about you; whether they be conversing familiarly together, disputing one among another, quarrelling, or even coming to blows: observe the behaviour of those about them, whether they be endeavouring to separate them, or amusing themselves with the sight of the scuffle; and whatever you remark in this kind, *design* upon the spot. For this purpose, it will be convenient to have a pocket-book always about you, the leaves of which may be fastened in such manner, as to take out without tearing. For

Preliminaries
to the painting
of history-
pieces.

these are things that you cannot preserve with too much care; the memory itself being far unequal to that infinity of objects which present themselves to a painter, and which he may find occasion to make use of in his future performances.

How to proportion the height of the first figure in a history-piece.

The height of the first figure in a history-piece must be less than the life, in proportion as it is removed behind the first line of the *plan* of your painting; the same rule holding in the diminution of the rest, which must be all correspondent to the distance of the *plan* they are placed in.

Of the relieveo of figures in a history-piece.

That figure in a history-piece, which is supposed to be nearest the eye, ought to have the greatest *relieveo*. The reason is evident, since in several parcels of the same colour, that must of necessity appear the boldest and most perfect, which has the least air interposed between itself and the eye that views it: it is for this reason that the shadows which discover the *relieveo* of opaque bodies, are always stronger and more obscure, in proportion as they are nearer; the eye viewing them at a distance, being confounded by the air, and unable to distinguish them from the colours of objects; whereas, when they are viewed near at hand, they appear in all their force, and give each body a *relieveo* in proportion to their deepness and obscurity.

Of the shortenings of figures.

When a painter has only a single figure to represent in a piece, he should avoid all *shortenings*, both of particular members, and of the whole body; since otherwise he will be every minute exposed to the impertinent questions of such as are unacquainted with his art. But in large compositions, where a great number

of figures are found, he may use his freedom ; and especially in battles, where there must of necessity appear an infinite variety of motions, and contortions, in the figures engaged in a scene so full of horror and confusion.

In large history-pieces, it will be necessary to introduce figures of various kinds, with regard to shape, complexion, *carnations*, and *attitudes*. Some must be represented fat and burly, others thin and shrivelled; some thick and short, others tall and slender; some gay and sprightly, others thoughtful and melancholy; some must have lank hair, others curled; the brisk and lively gestures of some must make a *contrast* with the slow and graver motions of others. In a few words, there must be variety in the form, colour, drapery, &c. of every thing that enters into the composition of the piece.

When you understand the make of a human body, it's members, *jonctures*, and the several positions these are capable of, apply yourself to the study of motion. And here you will find it of considerable service to draw flight sketches of any thing in the actions of those about you; these may be worthy of notice; taking care by the way, that the persons be not apprized of what you are doing, since, by this means, they will infallibly come short of that force and spirit in the action, which otherwise they would express. Thus, when two men are enraged, with what violence and fury do they rush upon each other? Their eye-brows move with briskness, and their arms swing impetuously every way; and every gesture and motion they shew, confesses the rage, choler, and passion that transports them. Now it will be impossible to make

How to study
the motions of
human bodies.

make a *model* express the zeal and fervour, with which a genuine rage is attended; or even to represent the effects of any real passion, as grief, admiration, fear, joy, or the like. A man is not so much master of his passions as to raise and lay them when he pleases. Let a painter therefore take his motions and attitudes from nature herself, rather than from those who would appear to mimick her; always remembering, that a just *contour*, and a lively *expression*, are the most important parts of his art.

The method to
be taken in
learning to
paint history-
pieces.

Your first essay towards painting a history-piece, should be the sketching out a few slight figures, and disposing them together; but you must first be able to design them well on all sides, and to manage the *shortenings* and extensions of each member with address. You may then venture to make a *group* of two figures fighting together with equal courage; observing to represent them in different manners and attitudes. Lastly, you may proceed to paint a combat between a brave cavalier and a coward; taking occasion, in all these pieces, to introduce variety of such accidents and passions, as may require *expression*, and enrich the subject.

Of the variety
necessary in h.s.
tory pieces.

In pieces of history a painter must shew something of a genius and a talent at invention, by the abundance and variety of his figures; studiously avoiding all repetition of the same thing, and striving to please the eyes of his spectators, by an appearance of novelty. Where the subject will bear it, therefore, let him venture to mingle men different in age, air, and dress, with women, children, dogs, horses, buildings, landscapes, hills, and the like; taking care that there be something of dignity in the appearance of a prince, or a person

son of quality, and that he be distinguished from the populace. He must further observe, that in the same *group** be never seen the gay and sprightly, mixed with the pensive and melancholic; it being natural for people of jovial dispositions to associate with those of their own kind; and, on the contrary, for the serious and grave to shun those of a different humour.

It is a fault, to which the *Italian* painters are extremely liable, (to wit,) the introducing entire figures of emperors and others, imitated from the ancient statues, into their pieces; or at least the giving their figures the air and appearance by which some of the ancients are distinguished: to avoid this fault, remember never to repeat the same thing, nor ever give the same face to two figures in the same painting. And in general you may take it for granted, that the more your *design* is diversified, by having that which is ugly placed near that more beautiful, an old man near a young one, a robust man near a weak one, the more pleasing your painting will prove. It often happens, that a painter having *designed* some animal, will make every stroke of it serve for his purpose; but herein he is overseen, for the members of the animal, while he was designing it, were usually in a posture by no means conformable to the action represented in the painting: thus, having finished the figure with a great deal of care and

The faces in a history-piece to be diversified.

* *Group*, an assemblage or knot of figures, gathered together in one *pelotoon*, *globus*, or bottom, as it may be called. One may illustrate it by a consort of voices in music, which altogether sustain one another, and from which, if you take away any one, the harmony becomes defective: so if a *group* be not well balanced with figures, something or other will appear disagreeable.

justnes,

justness, he has the mortification at last of finding himself under the necessity of effacing it, and supplying it's place with another.

How to match the colours in such a manner as that they give a grace to each other.

If you would have the neighbourhood of one colour give a grace to another, imitate nature, and do that with your pencil which the rays of the sun do upon a cloud, in forming a rainbow; where the colours fall sweetly into one another, without any stiffness appearing in their extremes.

Observe, further, the following remarks relating to colours:—1. In representing a deep darkness, be sure you oppose to it a strong white; and to set off a white with the greater force and lustre, let there be a deep dark opposed to it. 2. Red will appear more vivid near a pale yellow, than near a violet. 3. You must distinguish between colours, which set one another off with a greater force and brightness, and those which only add a grace to each other; thus green gives a grace to red, and at the same time takes it from blue. Lastly, a pale yellow or a white matches very ill with an azure; the union of these colours, as well as of some others hereafter mentioned, being of mutual disservice.

How to make colours appear vivid.

You must always provide a very white *ground* for colours which you desire to appear bright, provided they be transparent; for others a white ground is by no means suitable; as is found by experience, in painted glass, the colours of which appear extremely beautiful, when held between the eye and the light, but lose all their lustre when held to a thick dark air, or an opaque body.

Of the colour of the shadow of any colour.

The shadow of any colour must always participate of the colour of it's object; and that in a greater

a greater or less degree, as the object has more or less light, and as it is nearer or further distant from the shadow.

Among colours more obscure than the air, The variety ob-
servable in co-
lours, as they
are nearer or
more remote. that will appear the most visible, which is seen at the greatest distance; and, on the contrary, among those brighter than the air, the furthest removed will be the dimmest and least distinct. Thus all things in general may be said to change the nature and quality of their colour, by being viewed from a great distance; the brightest, in that case, appearing more obscure, and the dimmest more vivid.

A body loses it's colour at a greater or less distance, as the eye and the object are at a greater or less height from the earth. At what dis-
tance the colour
of a body disap-
pears. This proposition I thus demonstrate: the air being more or less dense as it is nearer or more remote from the earth, it follows, that where the eye and the object are but a little elevated above the surface of the earth, the grossness and density of the interposed air must weaken and obscure the colour of the object: but when both the eye and the object are considerably raised above the lowest region of the air, the pureness and subtilty of the *medium* will yield an easy passage to the *species* of the object, so that the eye will receive them without any sensible diminution of their lustre. In fine, that variety and degradation, observable in the colour of an object, is not only owing to the light, which, at different hours of the day, is unequally splendid, but to the different *rarity* and density of the atmosphere, through which the colour is transmitted to the eye.

The shadow of white, exposed to the air, The colours of
the shadow of
white. will appear bordering upon blue. The reason is

is owing to this, that white is not properly a colour of itself, but only the subject or receptacle of other colours. Now having already shewn that every body partakes of the colour of it's object, that part of a white surface opposed to the air, must of necessity appear tinged with it's azure.

What colour
produces the
darkest shadow.

The shadow bordering the most upon black, is that which is cast on the whitest surface; and this surface is more peculiarly dispos'd to produce variety of shadows, than any other: for white being no colour of itself, but barely a disposition to receive all colours indifferently, white surfaces partake more intensely of the colour of their objects, and render it more vivid, than a surface of any other colour. This is particularly observable where the object is black, or of any obscure colour far removed from white; in which case the white appears sensibly clouded, and there is a visible difference between the principal lights, and principal shadows.

A colour some-
times seen with
the same force
at different dis-
tances, and in
airs of different
densities.

It may sometimes happen, that the same colour shall not receive any alteration, though viewed at different distances; this must be the case when the several densities of the air, and the several distances whence the colours are seen, bear the same proportion. The proof is as follows: let *A* be an eye, [Tab. 1. Fig. 9.] and *H* any colour that you please, placed one degree distant from the eye, and in an air 4 degrees dense; now, because the second degree above *AMNL* is twice as subtil as the degree beneath, the colour must be twice the distance of *AH*, removed from the eye in *AMNL*, to make it appear the same that it did in the former degree; and of course must be placed in the point *G*: fur-

ther, if the colour be raised to a degree twice as subtil as the second, *viz.* to $OMP\bar{N}$, it must be removed to the distance E ; in which case the line of it's distance AE , will be equivalent, in quantity of air, to the distance AG , as will appear from the following demonstration: if in the same density of air, the distance AG interposed between the eye and the colour, take up two degrees, and AE two degrees and a half, that difference is enough to prevent the colour G , from undergoing any alteration in it's removal to E ; because the two degrees AC and AF , being in the same density of air, are alike and equal; but the degree of air CD , though equal in length to the degree FG , is nevertheless unequal to it in density, because it is found in an air twice as subtil as that below; one half degree distance of which last, intercepts as much of the colour as a whole degree of the former. By calculating, therefore, first the densities of the air, and lastly the distances, you will find the colours to have changed their places, without any alteration in their lustre. The density of the air you may calculate thus: the colour H is placed in an air four degrees dense, the colour G in two, and that E in one; now let us see whether the distances be in a reciprocal proportion, but converse; the colour E is distant from the eye two degrees and a half, the colour G two degrees, and the colour H one; but these distances not bearing an exact proportion to the densities, we must proceed to a third *calculus*, somewhat after this manner: the degree AC , we have already supposed similar and equal to that AF , and the half degree CB is similar, but not equal to the degree AF , as being but half a degree in length, which at the same

time is equal, in quantity of air, to an entire degree of that above it. The calculation will now be found compleat and satisfactory; for AC is equivalent, in quantity, to two degrees of the air above, and the half degree CB is equivalent to one entire degree of the said air, and another degree is found between BE , which makes the sum of AE equivalent to four degrees of density: thus, AH has likewise four degrees of density, and AG has four in like manner, *viz.* AF two, and FG as many, which added together make four: so that, if the distance AE be not double the distance AG , nor quadruple the distance AH , yet has it that deficiency supplied by the half degree of dense air CB , which is equivalent to a whole degree of the subtil air above. Thus have we proved our proposition, which was, that the colour GE , will be seen the same, at different distances.

Of the perspective of colours. The same colour being placed at different distances, but at equal heights, it's force or lustre in each position will be proportional to it's respective distance from the eye that views it; as may be thus proved: suppose $EBCD$ divided into four parts, each of the same colour; let the first, E , be removed from the eye A two degrees, the second B four degrees, the third C six degrees, and the fourth T eight; as is shewn in the arches terminating on the line AR ; [Tab. 1. Fig. 10.] lastly suppose the space ARS a degree of subtil air, and the space $SPET$ a degree of denser air; now the colour E , to arrive at the eye A , must pass through a degree of dense air ES , and another degree of more subtil air SA ; and the colour B must send it's species or image to the eye A , through two degrees of dense, and two of subtil air; the

the colour *C* through three degrees of dense air, and three of subtil; and the colour *T* through four degrees of dense, and as many of subtil air. Thus it appears by this example, that the proportion of the weakening or degradation of colours, is the same with that of their distances from the eye that views them; but this is only to be understood of colours seen at equal heights; the same rule not holding when they are situate in different parts of the air, whose different densities alter and weaken them unequally.

A colour will appear the same, though removed into different places where the air is of different densities, provided the distance and the density of the air be reciprocally proportional; that is, provided the colour be no more weakened by the distance of the eye, than it's passage is facilitated by the thinness of the air. This may be thus proved: suppose the first or the lowest air to have four degrees of density, the colour to be one degree distant from the eye, and the second air, which is higher than the first, to have lost one degree of it's density, and to be only possessed of three; add one degree to the distance of the colour; and when the air, which is still higher, has lost two degrees of it's density, and the colour has gained two degrees in distance, then will your first colour and your third be perfectly alike: in a word, if your colour be raised so high, as that the air there want three degrees of it's density or grossness, and that the colour be removed to three degrees of distance, then you may rest assured that the high and distant colour will receive a diminution of lustre, equal with that of the lower and nearer colour; because, if the air on high want

How a colour
may appear
without any al-
teration, though
seen in different
places, and
where the air is
differently
dense.

three quarters of the density of that below, the colour at it's utmost altitude has added three quarters to it's primitive distance from the eye; which was the thing we intended to prove.

Different colours may appear equally obscure by means of the same shadow.

It is by no means impossible, but that all the several colours we see, when involved in a shadow, may equally lose their different lustres, and appear transformed into the single colour of the shadow itself: this in effect is no more than what happens every dark night, during which, we are unable to distinguish either the figure or the colour of any body whatever: for darkness being nothing but a mere privation of all light, both incident and reflected, by means of which we discern the forms and colours of objects; it follows, that the cause being taken away, the effect must cease of course.

Why the eye cannot discern some objects, though really illumined.

There are several places really enlightened, which nevertheless appear full of darkness and obscurity, and where the things that are found, remain entirely devoid both of form and colour. This phenomenon is owing to the light of the air, interposing itself between the eye and the object; and appears very sensibly in windows, which when viewed from afar, the eye sees nothing within them, but a continued uniform obscurity; whereas entering into the places themselves, you will find them well illumined, insomuch that you may be able to distinguish the figures and colours of the most minute objects within them. These two very different impressions are owing to the natural disposition of the eye, whose weakness being unable to support the too powerful brightness of the air, the pupil contracts itself, and by that means loses a great deal of it's force; on the contrary, in places more obscure, the pupil dilates itself, and acquires

acquires new force, in proportion as it increases in extent ; by this means, taking in the images of objects, and seeing their parts very distinctly, which before were invisible.

An object never appears in it's proper colour, but where the light illumining it is of the same colour with itself: this is seen very sensibly in the colours of stuffs, the enlightened folds of which, throwing reflexes, or casting light on the opposite folds, shew them in their natural colours. Gold-leaves have the same effect, when they reflect their light reciprocally from one to another; whereas, when they receive their light from any other colour, they appear very different.

A colour will never appear uniform and equal in all it's parts, unless it terminate on a ground of the same colour: this is visible in black, when found on a white ground; each colour, in that case, appearing stronger towards it's extremes than it's middle, by reason of the foil and opposition of it's contrary.

A transparent colour being laid on another colour of different kind, forms a third, partaking of each of the two simples that compose it. This is observable in smoke, which meeting with soot in it's passage through the chimney, becomes blue; but being mounted into the air, which is azure itself, appears brown or reddish; this purple laid upon blue, forms a violet, and blue mingled with yellow, becomes green; saffron colour laid upon white, turns yellow, and white upon black, produces azure; which last will be brighter, as the white and black are more excellent.

It must here be observed, which part of the same colour, under it's different circumstances, appears

An object never appears of it's genuine colour, unless it receive it's light from a colour of the same kind.

Colours receive some alteration by the opposition of the ground they are upon.

The changes of transparent colours on being laid upon others.

The degree of lustre in which each

colour appears the most beautiful ; whether that which receives the strongest light, or that faintly illumined ; that of a shadow, or that of a half shadow, or even of a reflex upon a shadow. To this end it will be necessary to know the particular colour in question, there being a great difference among colours in this respect ; one appearing the most beautiful in one degree of strength, and another in another : for instance, the perfection of black is in the depth of it's shadow ; white, on the contrary, is the most beautiful in it's lightest part ; azure, green, and lake, in half shadows ; red and yellow in their strongest lights ; and gold in it's reflexes.

The lights of any colour more beautiful than it's shadows.

All colours are more beautiful in their enlightened, than in their shadowed parts ; the reason is, because light shews the species and the qualities of colours, whereas shadow obscures them, puts out their natural beauty, and hinders them from appearing what they are. If you object, that black is the most beautiful in it's shadow, the answer is very easy, for black is no colour.

What colours the most apparent.

The brighter any colour is, the better it may be seen at a distance ; the darkest has an effect quite contrary.

What part of a colour ought to be the most beautiful.

Suppose *A* a light, [Tab. I. Fig. 11.] *B* a body directly illumined by it, *E* another body out of the reach of *A*, and only receiving light from *B*, which is supposed of a red colour. In this case, the light communicated from *B* being of the same colour with the body, will tinge with red the opposite body *E* ; so that if *E* were of a red colour before, it's redness will now be heightened, and rendered much more beautiful than that of *B* : but supposing

posing it to have been yellow before, then will there result from the mixture of these two, a dubious colour partaking both of the one and the other.

Since it is by means of light that we discover the quality of colours, it follows, that where there is the most light, we see most of the real colour of the body enlightened; and that where there is the most darkness, the greatest share of colour is lost in the shadow: for this reason, a painter must always remember to lay the most perfect and beautiful of his colours on the enlightened parts.

The green colour, made of copper-rust, commonly called verdigris, though ground in oil, will not fail to evaporate in smoke, and lose it's beauty, unless you cover it with a thin skin of varnish, immediately after laying it on; but this is not all, for if you wipe it with a sponge dipped in clear water, it will rise from the bottom of the painting, and peel off like a water-colour. This is particularly observable in moist weather, and seems to be owing to this, that verdigris being a kind of salt, is easily dissolved in moist air; and especially if softened with the additional wetness of a sponge.

Some aloes *Cavallino* mixed with your verdigris, will make it much more beautiful than it was before; and it would become still more so by the mixture of a little saffron, could it be prevented from evaporating. The goodness of your aloes will be found in it's dissolving in hot *aqua vitæ*, which dissolves it much better than cold: and if after using any of the verdigris you go slightly over it with some of this liquified aloes, you will find the colour become incomparably beautiful. Further, this aloes may

The most beautiful part of a colour to be placed in the light.

How to augment the beauty of verdigris.

be ground in oil, either by itself, or with verdigris, or with any other colour that you please.

Of the mixture
of colours one
with another.

Though the mixture of colours one with another, do almost admit of an infinite variety, yet must it not be passed over without a few transient remarks. Accordingly, in the first place, I shall lay down a certain number of simple colours as a foundation; with each of these, mixing each of the rest, one by one, afterwards two by two, and three by three, proceeding thus to an entire mixture of all the colours together: afterwards, I shall begin to mingle these colours over again, two by two, then three by three, four by four, and so to the end; upon those two colours shall be laid three, and to these three shall be added three more, afterwards six, and so on, continuing this mixture through all the proportions. Now, by simple colours, I mean such as cannot be made or supplied out of the mixture of any other colours: white and black I do not reckon among colours, the one representing darkness, and the other light; that is, the one being a mere privation of light, and the other mere light itself, either original or reflected; I shall not omit to speak of these, however, their use being of the last importance in painting, which is nothing in effect, but a composition of lights and shadows, that is, of bright and obscure. After white and black, comes green and yellow, then azure, after tanned or oker, then violet, and lastly red. These eight being all the simple colours in nature, I now proceed to speak of their mixture. In the first place, mix black and white together, then black and yellow, and black and red; afterwards yellow and black, yellow and red, &c. But, because paper begins here to fail me, (says the author,) I shall treat at large of the mixture of colours, in a work by itself.

The

The surface of every opake body partakes of the surfaces of dark bodies. Of the colour of the body that enlightens it. This appears in the instance of dark bodies, none of which shew either their figure or colour, unless the medium between the body and the light, be illumined; if the opake body therefore be yellow, and that whence the light comes blue, the illumined part of the opake body must of consequence be green, that being the result of blue and yellow mingled together.

A white surface is better dispos'd for the reception of any colour, than the surface of any other body; provided the latter be not transparent. To prove this, we say that every empty body is capable of receiving that, which another body, not empty, cannot receive; now if you allow white to be empty, or in other words, void of all colour, it follows that being illumined by a body of any colour whatever, it must retain more of that colour than black, which, like a broken vessel that has lost it's retentive faculty, lets the colours slip as fast as it receives them.

The surface of any body will partake most of the colour of that object which is nearest it; the reason is obvious, for the species issuing from a near object, must lodge in greater abundance upon the surface, and make a greater alteration in it's colour, than those emitted from a body more remote; hence it's colour will be more vivid, and more perfect in it's kind, than if it came from a body at a greater distance.

The colour of an opake body will be so much the more perfect, as it is nearer another body of the same colour.

Bodies appear visible at greater distances, in proportion as their colours are in greater quantities.

ties. Hence we see why faces disappear even at moderate distances, the greatest share of them being possessed by shadows, in comparison of which, the lights are very inconsiderable. Thus every face becomes obscure at a shorter distance, as the shadows bear a greater proportion to the lights: further, a face will become so much the darker as it has more white opposed, either before or behind it.

How to design from *relievo's*, and to prepare the paper for that purpose.

A painter, to design from *relievo's*, must tinge the surface of his paper with a pale imperfect shadow; he may then proceed to dispose his deeper shadows; and lastly, to give his work the finishing cast, let him touch his principal lights, but with a great deal of address and conduct, it being these last touches, which, at a moderate distance, do the soonest disappear to the eye.

Of the changes observable in colours according to their greater or less distance from the eye.

Among colours of the same kind, that which is nearest the eye will undergo the least alteration; the reason of this is evident, for the air interposed between the eye and the object, has always some effect upon it, and alters it's colour, either in a greater or less degree; when the interposed air, therefore, is found in a small quantity, it must needs communicate a less share of it's own azure to the species transmitted through it, and therefore will discolour it less, than when the said air, being in a greater quantity, has both a greater share of colour, and makes more resistance to the species, in their passage.

Of the verdure seen in the country.

In a campagne of the same quality and kind, the verdure of trees and plants will appear more obscure, and that of fields more bright.

An obscure verdure will approach nearer an azure, than a bright one; azure being composed of bright and obscure seen at a great distance.

Of

Of all surfaces, there is none whose genuine colour is harder to be discerned than those which are bright and polished. This is observable in some herbs, and in the leaves of some trees, whose surfaces being smooth and shining, assume that colour which the sun's *reflex* casts upon them ; or, at least, that of the air, which illuminates them : insomuch, that in those parts where these *reflexes* strike, the real colour is but little seen.

Those bodies, of all others, do best discover their natural colour, whose surfaces are the roughest and most uneven. This may be seen in cloth, linen, leaves of trees, and herbs that are furry, on which the light cannot gather in any quantity, and which, for that reason, being unable to receive the image of neighbouring objects, send their colours pure and unadulterated to the eye. Hence, these bodies are neither tinged with the blueness of the ambient air, nor discoloured with the redness of the setting sun, even when he paints the clouds, and the whole horizon with his colour.

The colours, vivacity, and light of a painted landskip, will never vie with those of a natural one illumined by the sun, unless the painted landskip itself be likewise enlightened by the same luminary.

By how much the air approaches nearer the horizon, by so much it will participate the more of an azure ; and, on the contrary, the more remote from the horizon, the dimmer and more obscure will it's blue be seen. The reason of this I have already given in my Treatise of Perspective ; where I have shewn, that a body both receives and reflects a less share of light, in proportion as the body is thinner, and less

What bodies do not shew their real colours.

What bodies do best discover their natural colours.}

The light of a landskip.

Of the perspective of the air, and the diminution of colours seen at a distance.

less subtil. Now it is confessed, that the air far distant from the earth, is purer and more refined than that in it's neighbourhood; of consequence, therefore, the upper regions of the heavens must be darker and more obscure than the air below, through which the sun-beams penetrating, enlighten an infinity of atoms swimming in it, and thereby render it visible to the eye. Hence, the species of the above-mentioned dark regions, passing through those more enlightened ones underneath, the whiteness of the latter must of necessity be qualified by the obscurity of the former, and will thereby become azure. Now this azure will appear still brighter, as the quantity of air interposed between the eye and the obscurer parts is greater; as for instance, suppose the eye placed at *P*, [Tab. I. Fig. 12.] and let it look along the line *PR*; then lowering a little, let it look along the line *PS*; in this latter case the air will appear somewhat brighter than in the former, because it looks through a greater quantity of gross air; but if the eye look directly toward the horizon, then the azure which appeared deep in the first line, and somewhat fainter in the second, will in a measure wholly disappear in the third, there being a much greater quantity of gross air in the horizontal line *PD*, than in the oblique one *PS*, or the perpendicular *PR*.

Of air seen in
the water of a
landscape.

Colours dimi-
nished by the
medium.

That air alone will have it's image represented on the surface of the water, which is reflected from the water to the eye between equal angles; that is, whose angle of incidence is equal to it's angle of reflexion.

Every visible object will shew so much less of it's natural colour, as the medium between that object and the eye is more dense.

Two colours, one whereof serves for a ground to the other, whether they be illuminated, or supposed in a shadow, will appear free and loose from each other, in proportion as they are found in different degrees: that is, one obscure colour must never serve as a ground for another; but for that use you must chuse some very different colour, as white, or some other colour, bordering in the same degree upon white, as the other appears bordering upon black.

When one white body serves as a ground to another, these two whites will either be equal, or they will not: if they be equal, then that supposed to be nearest you, may be a little obscured towards it's extremes bounding on the other; but if the ground be less white than the colour laid upon it, then will the latter loosen itself, of course, from the other, so that you need not have recourse to any expedient or artifice whatever.

White appears the brighter, as the ground it is found on, is more obscure, and, on the contrary, more obscure, as it's ground is more white. This is visible in fleeces of snow, which, while they are floating in the air, illuminated on every side, appear less white, than when viewed over against an open window, where the obscurity within-side makes a dark ground, and sets off the falling fleeces with an exquisite white. It must likewise be observed, that snow, when viewed near at hand, seems to fall with quickness, and in large continued quantities; whereas, at a distance, it appears in small flakes, and those descending very slowly.

Among

Of the grounds proper in painting. Among things equally bright, that will appear the most dim, which is seen on the whitest ground; and that, on the contrary, will appear the most vivid, whose ground is the most obscure. *Carnation* will appear pale upon a red ground, but a bright and vivid red upon a yellow one. In like manner, all other colours may be made to appear different from what they are, by means of the ground wherewith they are encompassed.

Of grounds. It is a thing of the last importance, and which deserves the most mature consideration, to chuse proper grounds for your figures, and to dispose your opake bodies in such manner as may be most advantageous to their lights and shadows: always taking care that their illuminated parts appear on dark grounds, and their shadowed parts on grounds that are more bright; an instance of which you may find in *Tab. I. Fig. 14.*

A common mistake in painting country-pieces. Many people are of opinion, that, in an open campagne, the figures must appear more obscure, in proportion as they are further removed from the eye; but herein they are unhappily mistaken, for the very contrary method ought commonly to be observed, excepting where the thing to be represented is white; as we shall have occasion to shew more at large underneath.

Of the colours of objects far distant from the eye. Those objects viewed through the greatest extent of gross air, appear the most tinged with it's azure; so that the air communicates a greater share of it's colour to a body seen at two miles distance from the eye, than to the same body when seen at half that distance. Here some one may object, that in Landskips the trees near at hand appear brighter than those at a greater distance, which seems to overthrow

our

our proposition ; but this objection is usually false, when understood of trees ranged at equal distances ; and does only hold true, where the nearest trees are placed so wide from each other, that between them you see the light of the air, and of the intermediate fields, the more remote at the same time being closer and more compact, as is often observed on the banks of rivers, where the trees are seen so near to each other, that they join their shadows, and prevent either the verdure of the fields, or the brightness of the air, from appearing. It must be observed, however, that as the shadowed part of a tree is more large than the part illumined, it's image will be stronger, and will preserve itself better, than that of the other ; for which reason, a far distant tree may happen to appear more obscure than a near one, notwithstanding the azure brightness communicated by the air to the latter.

That which is beautiful, is not always good : this is intended for certain painters, who are so taken with the beauty of their colours, that they can find no room for shadows ; never using any but what are slight and almost insensible. These people have no regard to that force and *relievo* which figures receive from a bold shadow ; and are somewhat like your fine talkers, who use abundance of good words, but without any meaning.

The ocean has no uniform, universal colour appearing the same throughout ; a spectator at land sees it obscure, and especially near the shore, some white waves appearing near the horizon slowly moving, like flocks of sheep ; to those at sea it appears blueish ; and the reason of this difference is no hard matter to determine ;

Degrees of colour in painting.

The sea of different colours, when seen from different places.

mine; the ocean having the faculty of a mirror, representing the azure of the air at high sea, and the obscurity of the earth nearer shore.

The effects of drapery on carnations.

A black drapery makes the *carnations* of figures appear whiter than they are, and on the contrary, white garments make them shew more obscure: a yellow dress heightens them, and a red one turns them pale.

Colour of the shadows of bodies.

The colour of a body shadowed by another body, will never be pure in it's shadowed part, except the colour of the object, whence the shadow comes, be the same with that on which it is cast: for instance, if in a chamber the walls of which are green, be exposed some body whose colour is blue, and illumined by another blue; in this case the enlightened side of the object will be seen of a very beautiful blue, the shadow at the same time appearing foul and disagreeable; retaining nothing of the brightness of it's original azure, but mixing and debasing it with the green reflected from the walls; and the effect would be still the worse, were the walls of a tanned colour.

Diminution of colours in dark places.

In luminous places, gradually and uniformly retreating to perfect darkness, a colour will dwindle with an insensible diminution of lustre, as it removes further from the eye.

Of the perspective of colours.

The primary colours must be all pure and simple, and the degrees of their weakening, and those of their distances, must agree reciprocally to each other; that is, the bigness of objects must partake more of the bigness of their point of view, as they are nearer it; and in the same manner, the colours must participate more of the colour of their *horizon*, as they approach nearer thereto.

The

The colour between the shadowed and enlightened parts of the opake bodies, will be less beautiful than that entirely illumined ; the principal beauty of colours therefore is seen in their principal lights.

The azure of the air arises from it's being a dense transparent body, illumined by the sun, and placed between the earth and the darkness of the upper regions. Of itself, it is entirely void of all qualities, having neither smell, taste, nor colour; yet does it easily assume those of things about it, insomuch that it appears of an azure, by so much the more perfect as the darkness behind it is more gross, and the light it receives more vivid; provided, however, that it be at a suitable distance, and not too much charged with moist vapours. It may further be observed, that towards mountains the air appears of the most perfect azure, which the eye sees at the greatest distance, and which is interposed between that and the most obscure part of those mountains; the nearer and more illuminated hills communicating their own colour to the air, in their passage to the eye.

Among colours which are not blue, that which comes the nearest black, will participate the most of azure at a distance; and on the contrary, that colour will best preserve itself at a distance, which has the least conformity with black. It follows, therefore, that the verdure of fields will sooner transform itself into azure, than white or yellow; and for the same reason, white and yellow will change less than red and violet.

The colours placed in shadows, will retain more or less of their natural beauty as they are seen in a greater or less obscurity; but if they be seen

seen in any light place, then will their beauty appear the more elevated, as their place is more illumined. Some may object, that the variety in shadows is as great as in the colours of things shadowed; to which I answer, that the colours seen in shadows, shew so much less variety among themselves, as the shadows they are situated in, are more obscure. This is confirmed by those who, standing without doors, look into dark churches, where the paintings, though diversified in colours, do, nevertheless, all appear wrapped up in one universal shadow.

The ground en-
compassing a
figure.

The ground wherewith a painted figure is encompassed, must be more obscure than the enlightened part, and brighter than the shadowed part of the said figure.

White no co-
lour.

White is not a colour in itself, but only a faculty or disposition in bodies to receive colour. When it is exposed in the open air, it's shadows do all appear blueish, because the surface of every opake body partakes of the colour of the object that illuminates it. If it be screened from the light of the sun, by the interposition of any opake body, it will remain blank, without the appearance of any colour whatever. When it is exposed to the light of the sun, and the air, it participates of the colour both of the one and the other; that part of it turned from the sun, appearing obscure, being tinged with the azure of the air alone. Lastly, white, if secured both from the greenness of the champagne, and the whiteness of the horizon around, would, without doubt, appear simply and without alteration of the colour of the air.

The colour re-
flected from
fire.

The light of a fire tinges every thing it illuminates, with yellow; but this does never appear,

pear, excepting when viewed in opposition to some other thing enlightened by the air. It may be observed towards the close of the day, and better about the dawn, or in a dark room ; where a ray being reflected from the air, and another emitted from a fire or candle, upon the same object, their difference will be very plain and obvious. But without thus opposing them to each other, their difference would be scarcely sensible; nor without this method would it be easy to distinguish between several colours which bear a near affinity to each other; as for instance, white and yellow, sea-green and azure; for, in effect, the light illumining the air, being yellowish, tinges the blue into a kind of green, which may be further improved into a very beautiful green, by the mixture of a little more yellow.

When an opake body is found between two lights, the effect will be as follows :—these two lights will be either equal to each other in force, or they will be unequal : if they be equal, they may yet differ two ways with regard to the brightness which they cast upon the object, which will be either equal or unequal ;—equal when their distances are equal, and unequal, their distances being so. The object placed at an equal distance, between two lights equal both in brightness and colour, may further be illumined by these lights in two different manners; (to wit,) either equally on every side, or unequally ; it will be equally enlightened, when the space remaining around the lights is equal both in colour, shadow, and brightness ; and unequally, when these spaces around the lights are found to differ in their colour, brightness, or degree of obscurity.

Of an opake body placed between two lights

It

Of the colour of
shadows.

It often happens, that the illuminated and shadowed parts of the same body are seen of different colours; the one, for instance, appearing red, and the other green; the body itself being all the while uniform and alike in it's colour, throughout. Now this is observed, when the light issuing out of the east, strikes upon an object, and tinges it with the colour of it's own rays; another object, at the same time, being placed to the westward, of a colour different from the first, and illuminated by the same light. In this case, the light reflected from the latter object, bounding towards the east, will strike upon those parts of the first object which fall in their way; and, stopping there, will communicate the light and colour of the one object to the opposite side of the other. Myself have frequently observed a white object with red lights and blue shadows; this being no uncommon appearance, in mountains covered with snow, when the sun, at his setting, paints the whole horizon with a redness like flame. See *Fig. 15. Tab. I.*

On what occasions a bright ground is necessary in painting.

When a dark body is painted upon a bright ground, it appears with a great *relievo*, and seems to stand out free from the painting: the reason of this is owing to the curve surfaces of bodies, which, of necessity, growing dark on that side turned from the light, the difference between the ground and that side of the figure, becomes very bold and conspicuous. It must further be observed, that the illuminated part of a figure ought never to terminate on a ground brightened by it's principal light:—to prevent which, it may be adviseable, between the ground and the chief light, to interpose the extremity of some other body, more obscure than

than either the ground or the light, respectively.

To make a bright figure appear with advantage, you must shew it on a dark ground; as to set off an obscure figure, your ground must be bright; for white ever appears the best nearest black; and, in general, all contraries appear with a superior force, when opposed one to another.

Of simple colours, the first in order is white: this, and black, we know are excluded by the philosopher out of the number of colours, the one being the cause of colour, and the other it's privation; however, inasmuch as they are indispensably necessary for a painter, we shall not scruple to admit them among the rest. Yielding the first place among simple colours to white, yellow has the second, green the third, azure the forth, red the fifth, and black the sixth: white we shall lay down for light, without which no colour can be seen; we must have yellow to represent the earth, green for water, azure for air, red for fire, and black for darkness. As to compound colours, if you desire to arrive at a speedy knowledge of them in all their variety, do but take some pieces of painted glas, and through these survey all the several colours which present themselves to the eye, in a country scene; thus will you find the colour of every object which you view, mingled and adulterated with that of the glas, and may easily perceive which undergoes a change more or less to it's advantage; which receives additional beauties, and which are stripped of their original charms: for instance, if your glas be painted with yellow, you will find azure, black, and white, considerable sufferers by the mixture,

How to suit
your grounds
to your figures.

Of simple co-
lours and their
composition.

and

and at the same time, yellow and green will be beautified, and made more perfect. Other glasses will have their influences on other colours, all which you must carefully observe and consider; still chusing out, for your own use, such whose composition appears the newest, and most agreeable. When you have thus carried your observations through the whole variety of colours, and have viewed them all through a glass of each kind, proceed to combine glasses of different colours; using first two, then three, after four, and even five, or six, if you find occasion for so many; still observing the rules already laid down for the simple ones.

Remarks on
colours.

Azur and green are not simple colours in themselves, the former being composed of light and darkness, that is, of a perfect black and a perfect white, as we have already observed of the azur of the air; and the latter, of one simple colour, and one compound, to wit, azur and yellow, which, together, form a green.

An image exhibited in a mirror, does always participate of the colour thereof, and the mirror is reciprocally tinged with the colour of the image it exhibits; these do still borrow more, the one of the other, as the colour of the object is stronger than that of the mirror; and the image will ever appear more vivid, and perfect in it's colour, as that is nearer and more akin to the colour of the mirror.

Among the colours of bodies, that which is of the brightest white, will be seen at the greatest distance; of consequence, therefore, that will disappear at the smallest distance, which is the most obscure.

Among

Among bodies of equal whiteness, and equally distant from the eye, that will appear to be the whitest, which is encompassed with the greatest obscurity; and, on the contrary, that obscurity will be seen the darkest, which bounds on the brightest white.

Of colours equally excellent, that will appear the most perfect, which is seen nearest it's direct contrary: thus, a pale colour near a red one, black near white, (though neither the one, nor the other, properly a colour,) gold near azure, and green near red, appear with advantage; it being a natural property of all colours to shew themselves more, near their opposites, than near those alike to them.

A white object seen in a dark, thick air, will appear larger than it is in reality; the reason has been already assigned, where a black figure was shewn to enlarge itself on a bright ground.

The medium between the eye and the object disfigures the latter with it's own colour: thus mountains, at a great distance, are seen coloured with azure; thus a red glass tinges every thing seen through it, with red; and thus the light around the stars is altered and obscured by the darkness of the night.

The genuine colour of any body appears in that part, which neither receives any shadow, nor any bright light.

When a bright colour terminates upon an obscure one, the extremities of the former will, by that means, become brighter and more vivid; and those of the latter deeper and more obscure.

Among mountains far removed from the eye, Of the colour of mountains. that will appear of the most beautiful azure,

O which

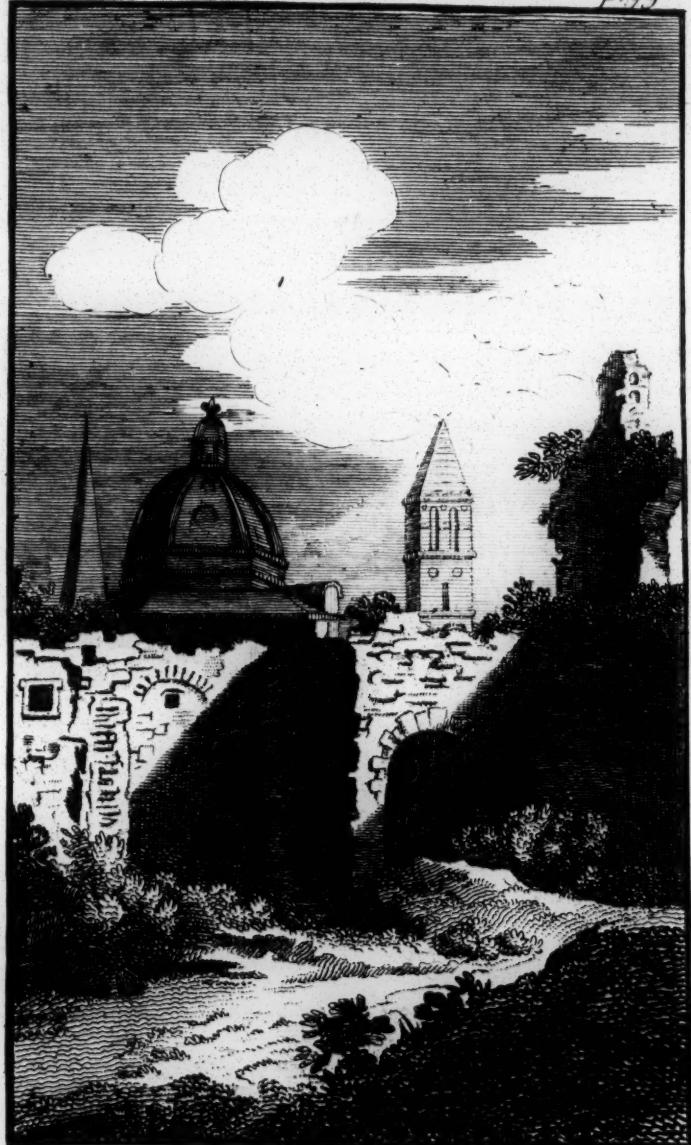
which is in itself the most obscure; and that will be the most obscure, which is the highest, and most covered with wood; because of the shrubs found beneath the larger trees, which being shadowed from the sun, appear dark and gloomy. Now the illumined air, interposed between these shadowy mountains and the eye, must of necessity have it's azure heightened and made more perfect by means thereof; and the tops of high mountains being likewise the more obscure, by reason of the thinness of their medium, will have the same effect on the air, through which they are viewed. It follows, therefore, from what we have already laid down, that the mountains themselves must appear under the same diversity of azures, with those of the airs through which they are viewed; and that the tallest, and the shadiest, will excel the rest in the beauty of their colour.

How a painter
may put in
practice the
perspective of
colours.

To enable yourself to manage the perspective of colours, and to make their changes, weakenings, and degradations, correspond to nature, take the following method:—In some open champagne, chuse out several objects placed at the distance of one or two hundred fathoms from each other; be they men, trees, houses, or the like. Now, if, for instance, your first object be a tree, place a glass over-against it, and holding your eyes steadily in the same position, *design* your tree upon the glass; tracing out the *contour* from the image before your eye: having done this, retire backwards till such time as the natural tree appears nearly equal with that you have designed; here you may colour the figure, taking your measures from the object appearing at a distance; and touching it with care and attention, till at length



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Pl. 2.

length it be brought to resemble the natural tree, both in form and colour; insomuch that, by shutting one eye, they may appear both painted alike, and both equally distant. Continue the same course, with regard to the other objects, at the second and third distance; treading up such pieces as you perform in this way, and consulting them on all occasions, as guides and rules for your conduct. By the experiments I have made in this kind, it appears, that the second object, at the distance of twenty fathoms beyond the first, diminishes four fifths of it's bigness.

There is still another kind of perspective, Of the aerial perspective. called the *aerial* one; which, by the different colours of the air, shews the different distances of several objects placed in the same line. For instance, if, in seeing a number of buildings rising behind a wall, which appear of the same bigness, and ranged in the same line, you have a desire to paint them in such manner, as that one may appear further removed from the eye than another; to favour this design, you must represent the air somewhat grosser than ordinary; because, in that case, it will tinge far distant bodies very sensibly with it's azure, as is observed in mountains, &c. This, once supposed, you may shew the building which appears first on the other side the wall, in it's natural colour: the next, which is to be a little further removed, must have it's *profile* a little more flight, and must farther shew a faint tincture of azure: the third, which is to be still further distant, must appear still more azure, in proportion: and if you would represent a fourth, removed five times the distance of the last, you must distinguish it with an azure five degrees

more strong and sensible. By this means, your buildings, though painted all in a line, and of the same bigness, will nevertheless discover themselves to be all considerably different, both in bigness and distance.

Remark on the proportions of a human body.

The measures of a human body alter in each member, as it is more or less bent, and in different aspects, always increasing or diminishing more or less on one side, as they diminish or increase more or less on the other.

The different proportions in the body of a man, and that of a child.

Man, in his first infancy, has the breadth of his shoulders equal to the length of his face; as likewise to that part of his arm between the shoulder and the elbow, when the arm is bent. It is, likewise, equal to the space between the elbow and the long finger; and, further, to the interval between the *juncture* of the knee and that of the foot. But when he is arrived at his utmost pitch, these measures become all double in length, except the face, which, together with the head, undergoes very little alteration. Thus, a man come to his full growth, if he be well proportioned, ought to be in height ten faces, the breadth of his shoulders, two faces, and all the other parts, just mentioned, as many. For the rest, we shall treat of them, when we come to consider the proportions of all the parts of a human body.

Children have their *junctures* contrary to those of men, with regard to bulk and grossness.

Little children have their *junctures* extremely small and slender, and the intervals between them grosser and more bulky; this happens because the *junctures* have nothing but a bare skin to cover them, and a few cartilaginous membranes to bind the bones together; all the soft and juicy flesh being lodged underneath the skin, between the several *junctures*. While the man is in his growth, the flesh discharges itself

of

of a great deal of these superfluities, so that his members, in proportion, become more slender. But the *jonctures*, which consist of nothing but bones and cartilages, not keeping pace with them in this decrease; the effect is, that the child who had his *jonctures* small and skinny, and the parts between them fat and plump, as is seen in the fingers, arms, and shoulders; when come to manhood, has his *jonctures* strong and bulky; the same parts being bold and prominent in the man, which were thin and hollow in the child.

Between a man and a child is found a very considerable difference in the length from one *joncture* to another; for a man, from the *joncture* of his shoulders to his elbow, and between the elbow and the tip of the thumb, and from the extremity of one shoulder to that of the other, has the measure of two heads; whereas the measure of a child in these parts is but one. The reason appears to be this, that nature, in the first place, employs herself about the head, as being the principal part, and the seat of the understanding; setting aside the other less considerable parts of her fabric, till she has formed the *capital*.

The *jonctures* of the fingers grow bigger on every side when they are bent; the more they are bent the more this appears, and the more they are straitened the less do they again grow. The same thing happens in the toes, and is always more sensible as they are bigger and more fleshy.

The *jonctures* of the shoulders, and of the other flexible members, shall be explained in my *Treatise of Anatomy*; wherein will be shewn the

A remarkable difference in the measures of a man and a child

The *jonctures* of shoulders.

the causes of the motions, in all the parts of a human body.

Of the Shoulders

The motions produced by the *junctures* of the shoulders are mostly simple; that is, the arm directed by them, is usually carried either upwards or downwards, backwards or forwards. Though these motions may be said to be infinite, yet, in effect, does the arm, in describing a circle on the wall, shew all the motions it is capable of. For every continued quantity being divisible *in infinitum*, and this circle being a continued quantity, produced by the motion of the arm around it's circumference, it follows, of course, that the motions of the shoulders are infinite.

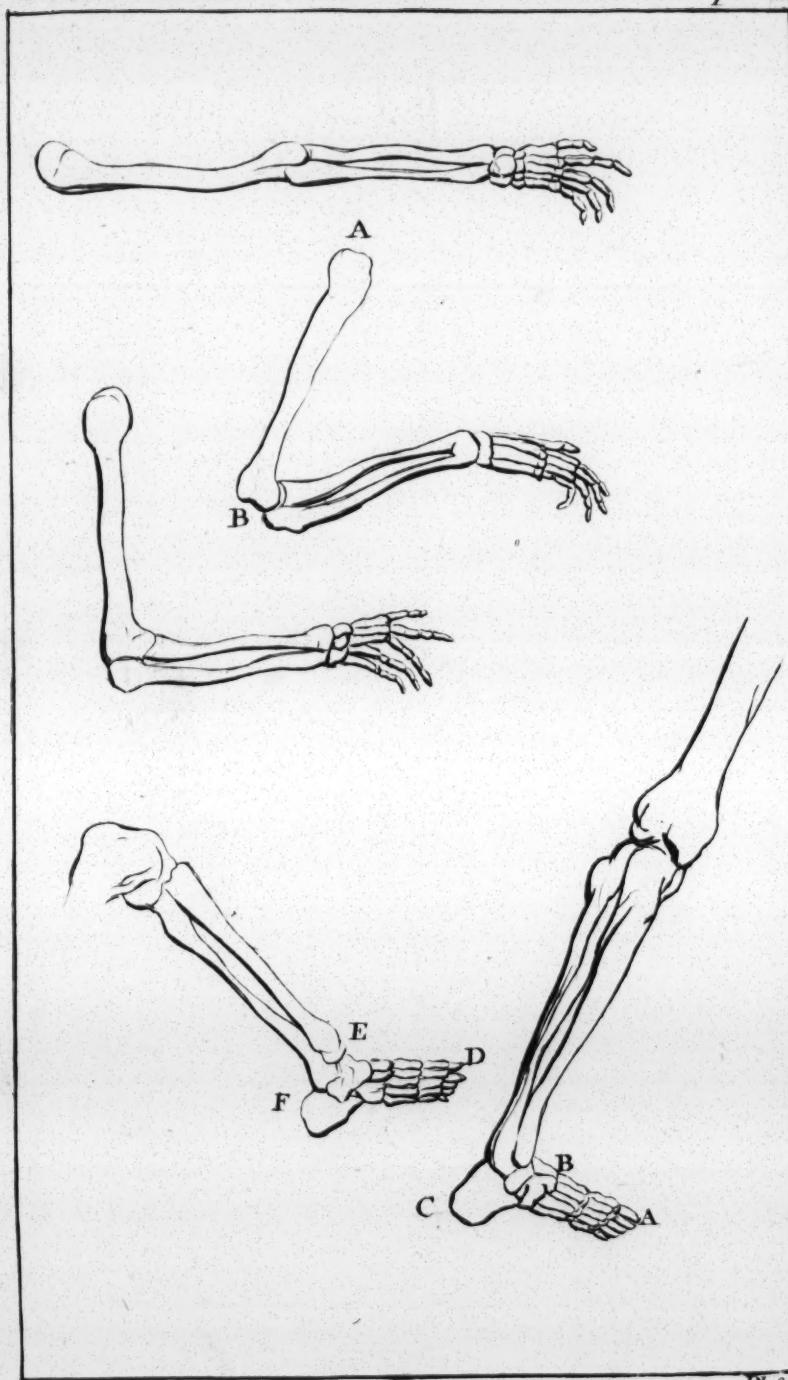
No universal
measure to be
prescribed for
the breadths of
figures.

Universal measures of bodies are only to be observed in the heights, not in the breadths of figures; it being one of the wonders of nature, that in all her infinite productions, we never find any one, of what kind soever, precisely like another. You, therefore, whose business it is to imitate nature, consider that variety which she sets before your eyes; and learn, from her, to diversify your contours; avoiding withal any thing monstrous and shocking, as legs too long, bodies too short, strait breasts, long arms, and the like; and indulging yourself chiefly in the *junctures* and thicknesses of members; it being in these, that nature herself seems to affect the greatest variety.

The arm longer
when bent than
when stretched
out.

A painter is indispensably obliged to be acquainted with *osteology*; that is, with the several bones serving as props to bear up the flesh, wherewith they are covered; and with the *junctures*, which occasion the limbs, in bending, to enlarge and diminish; for the length of the arm, when





when extended, is not equal to that of the same arm, when contracted; it always losing or gaining an eighth part of it's measure, as it is stretched out or drawn in. This shortening and lengthening of the arm is owing to the bone between the shoulder and the elbow; which, withdrawing out of it's cavity when the elbow is bent into an acute angle, [*as you see in the figure A B,*] adds to the length of that part of the arm; and this addition will be always the greater, as the angle at the elbow is more acute; and on the contrary, as the angle at the elbow grows more obtuse, this part of the arm must become shorter.

All the parts of an animal must bear a suitable-
ability and conformity to the whole: thus where the whole animal is thick and short, each member in particular must be so too; where it is tall and slender, the members must be tall and slender likewise; and where it is of an ordinary make, the parts must appear ordinary in like manner. The same thing must be understood of trees; those formerly felled being excepted out of the number; because these, in sending forth new cyons out of old trunks, destroy their natural form, and become, in effect, little better than so many vegetable monsters.

The wrist, or *joncture* of the hand and arm, of the *joncture* of the hand with the arm. becomes smaller when the hand is shut, and enlarges itself as the hand is opened; but the arm, on all sides, between the elbow and the shoulder, has a quite contrary effect; the reason is this, that whereas in opening the hand, the muscles which contribute thereto, being stretched out and extended, do render the arm more slender between the elbow and the hand; in clutching it, these same muscles being swelled

swelled and enlarged, start off from the bone, and by that means thicken and dilate the same part of the arm.

Of the *joncture* of the foot.

The enlargement and diminution of the *joncture* of the foot is only seen on the nervous side, which increases when the angle of the said *joncture* is acute, as in *D E F*, and decreases as that angle grows more obtuse, as in *Fig. A B C*.

Of the knee.

Among all the members of a human body, whose *jonctures* are capable of being bent; the knee is that alone which loses of it's thickness in bending, and becomes more gross as it is stretched out more strait.

Of the members of nuditie.

Naked men employed in any laborious work, or violent motion, do only shew such of their muscles, as playing along the side of any moving member, is the occasion of it's action; the muscles of each member appearing more or less distinct and bold, as the effort it exerts is more or less forcible.

Whence an arm moves with the greatest violence.

Of two arms, that will be moved with the greatest force, which being heaved out of it's natural posture, receives the most powerful assistance from the other members to recover it-self, and to drive it towards the place whither it would go; thus the figure *A*, heaves back it's arm with the club *E*, to recollect itself with the greater force, by the concurrence of the rest of the body, and to drive it with the greater violence upon *B*.

Of the motion of man.

The principal part of painting lies in the art of making happy compositions; the *expression* is the next part in dignity, and consists in giving each figure the necessary attention to what it is doing; and in making it shew a briskness and vivacity suitable to it's character, and agreeable

ble to the action it is about, whether that be slow and heavy, or whether it require a greater share of activity and fire: thus to throw a dart, a stone, or any the like projectile; let your figure be seen in such an *attitude*, and have such a disposition in all it's members, that it's intention may plainly appear. The two adjoining figures furnish you with instances of this kind; where their different attitudes do plainly shew them engaged in very different actions. *A* shews the greatest zeal and earnestness, and aims a dart; *B* appears more cool and languid, grasping a stone; now *A* will certainly throw his dart to a greater distance, than *B* his stone; because though they both look the same way, and seem to aim at the same mark, yet in effect *A* makes the most resolute effort; for his feet are turned on the side opposite to that where he meditates his stroke; so that in recovering himself, the parts spring nimbly back to their place, and discharge the dart with incredible velocity: on the contrary, the figure *B* having his feet, and the rest of his body, in a natural situation, acts at a disadvantage; so that it's motion is more feeble, and the stone is projected with less violence; for it may be observed, that every *impetus* or effort in general, to have a forcible effect, must begin with violent contortions, and end in free, easy, and natural motions: thus a fling, unless vehemently agitated itself, gives but a languid motion to the body it projects; and thus an arrow comes loitering out of the bow that is not vigorously drawn. Now the figure *A* having launched his dart, will find his whole force exhausted towards that quarter; so that though he immediately acquire new strength, yet that does only

enable him to recoil, and to make a motion contrary to that already made.

Of attitudes,
members, and
their motions.

Never let the same action be seen repeated in the same figure; neither in the principal members, nor even in those smaller and less considerable, as the hands or fingers; nor ever let the same attitude be seen twice in the same history-piece: where the subject requires a great number of figures, therefore, as a battle, a combat of gladiators, or the like, there being but three ways of wounding, viz. with the push, the cut, and the back-stroke, it will be necessary to diversify these three manners as much as possible; for instance, if one of your champions be seen dealing his blows with his back towards the spectator, let his fellow appear side-ways, and a third front-wise; still varying the same action by the different aspects of the actors. In battles, a compound motion has always a very good effect, and seems to animate and inflame the subject. A compound motion is that of a figure, when at the same time it shews motions, that appear to be contrary; as for example, when a figure shews the foreparts of it's legs, and at the same time a part of the body, by the profile of the shoulders: but of this we shall speak in it's place.

The motions of
the neck to be
observed.

In the *jonctures* of the members, and their several motions, take notice how the muscles swelling on one side, sink and disappear on the other: this is particularly observable in the necks of animals, the motions in that part being three-fold; two of which are simple, and the third compound, partaking of each of the simple ones; these are one of them shewn when the animal inclines it's neck towards one shoulder, and in bowing or raising it's head; the other appears when the neck is turned either towards

towards the right side or the left, without bending, the face looking over one of the shoulders, and at the same time standing upright ; the third, which we call the compound motion, happens when the bend of the neck is distorted, the ear being lowered towards one shoulder, and the face turned to the same place ; or towards the other shoulder, the face looking up to heaven.

All the members must appear in the exercise of that function to which they were destined ; for instance, in dead bodies, or those that are asleep, none of the parts must appear alive or awake ; thus the foot, which bears the weight of the body, must be seen as if sunk or squeezed in, and not with it's toes free and disengaged ; excepting where the figure is pitched upon it's heel.

The members
to be made fit
for their office.

The motions of the face, occasioned by sudden agitations in the mind, are very numerous ; <sup>Of the motions
of the face.</sup> the chief are laughing, weeping, shrieking, singing in several tones, shewing amazement, wrath, joy, sorrow, fear, vexation, grief, and other the like motions ; all of which we shall have occasion to consider hereafter. As to laughing and crying, the motions they produce in the face are very much alike, and the characters they impress on the mouth, cheeks, and eye-lids, not to be distinguished. Their only difference appears in the eye-brows, and in the space that separates these from each other, and shall be considered more at large, when we come to treat of the motions happening in the face, hands, and other members, under any sudden surprize. The knowledge of these motions is of the last importance to a painter ; and his figures, without this, will be dead in a double

capacity. Let him beware, however, of the other extreme; nor ever make their motions so affectedly animated, as to represent the ferment of a battle in a scene of calmness and composure, or the fury of a bacchanal, or fantastic gestures of a harlequin, in a subject which requires sobriety and peace. Observe further, that those whom you introduce as present at the action you exhibit, be attentive to what passes, with countenances and behaviour full of admiration, reverence, grief, distrust, tear, or joy, as shall be most suitable to the subject, and to the persons forming the assembly.

*Observations for
the designing of
faces.*

The bone and cartilage which compose the nose, may be varied eight different ways, which form as many different kinds of noses; for either they are equally strait, equally concave, and equally convex, which is the first kind; or they are strait, concave, and convex unequally, which is the second; or the parts above are strait, and those below concave, which is the third sort; or those above are strait, and those below convex, and this is the fourth sort; or else they are concave above, and strait below, and this is the fifth; or concave above, and convex below, which makes the sixth; or, lastly, they are convex above, and strait below, which is the seventh; or convex above, and concave below, which is the eighth kind. The setting on of the nose to the eye-brows, admits but of two different forms, for it is always either concave or strait. The forehead is capable of three various shapes, being either plain, concave, or convex; the plain is again divided several ways, for it is either hollow towards the top, or towards the bottom, or

or it is so both at top and bottom; or else it is plain and uniform both at top and bottom.

In order to retain the air of any man's face, whom you chance to see, apply yourself to the ^{A method of} _{remembering} ^{faces.} study and observation of the several different faces which present themselves before you; always taking especial notice of those parts which distinguish one man from another, and which contribute the most towards that infinite and amazing variety so observable in the species; these parts are the mouth, eyes, nose, chin, neck, and shoulders. The nose, for instance, admits of ten different shapes, and is either strait, crumpt, hollow, raised above or below the middle, aquiline, flat, sharp, or round; all which appear with the greatest advantage when seen sideways. Of noses proper to be seen frontways, there are twelve other kinds; even, big in the middle, small in the middle, big about the tip and small in the setting on, small at the tip and big at the setting on, nostrils wide, narrow, tall, low, the *foramina* open, or covered with the peak of the nose. Thus every other part, how minute soever, will afford something particular for your observation, all which being viewed with the necessary attention, will enable you afterwards to *design* them from your ideas. If this method be not altogether to your taste, you may observe that which follows: carry always a little pocket-book with you, full of various *designs* of the several parts just now mentioned; and when you find a necessity to retain any man's air, observe his face very nicely, taking all his features asunder, and considering them piece-meal; remembering still as you go along to cast an eye over your collection, and to match the natural parts

parts of the face with the artificial ones in the book, putting a mark on such of the latter as come nearest the former; to be afterwards joined together at your lodgings.

Of the beauty
of a face.

Never let the muscles in the face be too bold, or terminate too abruptly; but take care that the lights be sweet, and that they lose themselves insensibly in soft and pleasing shadows; for upon your conduct in this point depends all the grace and beauty of the face.

Of the equili-
brium of figures

The hole of the neck between the two *clavicles*, must hang perpendicularly over the foot that bears the body; if an arm be stretched out, the hole quits it's perpendicular, and if a leg be thrown backwards, the same hole advances forwards; so that in every new *attitude* it gets a new situation.

The motions of
a figure to ex-
press the senti-
ment of it's
mind.

A figure, whose motions are not perfectly accommodate to the sentiment or passion it is supposed to have, shews it's members to be in a state of rebellion, and to want that duty and allegiance which they owe to the mind. There must be a great deal of zeal and application, therefore, expressed in the behaviour of a figure, and it's action must be so proper and peculiar to the subject, that it cannot possibly serve to signify any other thing, nor be used on any other occasion, than that it is intended for.

How to touch
the muscles of
a nudity.

In naked figures those members must shew their muscles the boldest and most distinct, upon which the greatest stress is laid; and that these may have the better effect, observe not to distract the attention of those who view them by too great a multiplicity; only shewing the muscles of such members as have the most considerable share in the action exhibited; in comparison

parison with which, the rest must appear lax and ennervate.

A man either in running, or in moving a more gentle pace, must shew that part which is over the leg supporting his body, lower than the other.

The shoulders or sides of men, and other animals, will have the greatest difference in their height, when the whole body is found in the most leisurely motion; and on the contrary, these parts of the animal will come nearest to an equality in height, when the motion of the whole body is the quickest. This has been already proved in my Treatise of Local Motion, upon this principle; that every heavy body gravitates in the line of it's motion; so that if any whole be moving towards any place, the part which is joined to it, follows the shortest line of the motion of it's whole; without throwing it's weight on the lateral parts of the same whole.

It is objected against the first part of what I have said, that it is by no means necessary, that a man walking slowly, or standing still, should preserve a continual *equilibrium* of parts upon the center of gravity supporting the weight of his whole body; but on the contrary, that he is frequently seen bending on one side, even when the weight of his body does wholly rest upon one foot; and that at other times he discharges part of his weight upon the leg which is not strait, that is, on that bent at the knee, as is seen in the two figures *B* and *C*. In answer to which, I assert, that what is not done by the shoulders of *C*, is done by it's haunches; and that it at once preserves it's own *equilibrium*, and verifies my principle.

The

Of the different
heights of the
shoulders ob-
servable in ani-
mals when in
motion.

The stretching out of an arm changes the equilibrium of the body.

Of the center of gravity in animals.

Of a man bearing a burthen on his shoulders.

The equilibrium of a man, when standing on one foot.

The stretching out of an arm, drives the *equilibrium* of the body into that foot which sustains the whole weight; as is seen in those, who, with arms stretched out, can walk upon a rope, without the use of any pole as a counterpoise.

Every animal will have the center of it's legs, on which it rests, so much nearer the perpendicular of it's center of gravity, as it's motion is more slow; and on the contrary, the center of it's legs will be further removed from the perpendicular of it's center of gravity, as it is more quick and nimble in it's motion.

A man, in bearing a burthen, has always the loaden shoulder higher than the empty one. An instance of this, you have in the following figure, wherein the central line of the weight, both of the man and his burthen, passes through the leg which sustains the whole; were it not for this, and did not the weight of the body, and of the burthen, by being equally shared, thus make an *equilibrium*, the man of necessity must tumble to the ground. Now, to this it is requisite, that so much of the weight of the body be thrown on the side opposite to that which bears the burthen, as may make it a counterpoise to the other; and this can be no other way done, but by the man's bending on that side not laden, till such time as it comes to bear it's share of the additional load laid on the other. And this is the expedient, which witty, inventive necessity has recourse to on these occasions.

The weight of a man, who rests only upon one leg, is always equally distributed on bot' sides of the central or perpendicular line, which supports him.

A man,

A man, in walking, has the center of his ^{Of a man} gravity over that of the leg which is set on _{walking.}

Rest, or privation of motion in any animal, arises from the equality, or privation of inequality, between the opposite weights; which, as they occasion it to move by their inequality, so they keep it suspended, and at rest, by their equality.

That side of the body, on which a man bends, is diminished in proportion as the opposite side is increased; and the bending or flexure of this side may, at last, come to be in a subdouble *ratio* to the stretching of the other. But this shall be considered in a particular treatise.

As much as one side of any flexible member is lengthened, so much it's opposite one is shortened: but the central line, being without the side that is not bent, in a member that is, never gains or loses of it's length.

Every figure, in sustaining any foreign weight out of the central line of it's own magnitude, casts so much of it's own, or of the foreign weight, on the opposite side, as serves to make a perfect *equilibrium* about the central line, which passes through the whole mass, and terminates on that foot set on the ground. Thus, in bearing a burthen with one arm, we see a man naturally stretch out the other from him; and that not proving a counterpoise, he further bends his body the same way, till he has cast so much new weight on that side, as suffices to resist the load imposed on the other. We further observe, that a man, ready to fall on one side, never fails to stretch out the other to recover himself.

Different ways
of moving the
same weight.

To represent a man moving a burthen, consider that the motion may be made in different lines, viz. either from below upwards, with a simple motion, as in heaving a weight from the ground; or from behind forwards, as in drawing a weight after him; or simply forwards, as in shoving any thing before him; or, lastly, from above downwards, as in pulling at a rope which plays in a pulley. Here it must be remarked, that the weight of a man's body draws so much the more, as the center of his gravity is further distant from the center of the axis which sustains him: to this you must consider the effort wherewith the reins and legs, when bent, strive to recover their straitness; and that a man neither ascends, descends, nor walks in any other line whatever, without drawing up the heel of the hind foot.

All motion pro-
duced from the
loss of the equi-
librium.

All motion proceeds from a loss of *equilibrium*, that is, of equality, or ballance: this must always cease ere motion can commence; and ever the further any body is removed from it's *equilibrium*, the quicker and more violent is it's motion.

Of the equili-
brium of a fi-
gure.

A figure standing on one of it's feet, will always have the shoulder of that side lower than the other; and the hole of the neck, at the same time, perpendicularly over the middle of the leg which supports the body. This will be the case, in whatever line the figure be seen; whether it's arms be but little advanced from the body; whether it be free of any burthen on it's back, it's shoulder, or it's hand; or whether the leg out of office, be not far detached from the body, either forwards or backwards.

Of the gracefulness of the
members.

The members of a body must be so managed, as that they may produce the effect intended by the figure, in the most graceful manner: thus,

thus, in representing a figure that may appear noble and generous, observe that it's members be slender and genteel, the muscles not too bold and apparent, but even those which necessity requires to be seen, touched with softness and delicacy; the members, and especially the arms, must not appear stiff and obstinate, that is, they must not be stretched out in right lines with the other members to which they are joined; and if it be found necessary, on account of the position of the figure, that the right haunch be seen higher than the left, let the left shoulder be higher than the right; and let it's *juncture* hang perpendicularly over the most elevated part of the haunch: let the hole of the neck be always directly over the middle of the *juncture* of the foot on which the figure rests; and let the leg, which does not support the body, have it's knee lower than the other knee, and drawn near the other leg. As to the attitudes of the head and the arms, they are infinite, and therefore not to be brought within the compass of rules. All I think necessary here to intimate, is, that they must be free, natural, and various; and that without these qualifications, the members will appear no better than so many pieces of wood.

With regard to the disposition of the members, observe that in representing a person turning, either backwards or aside, you never shew his feet and the other members directed the same way with the head; but let them rather share the action among them, and form a kind of *contrast*, or *contrariety* in the four principal *junctures*; which are those of the feet, the knees, the haunches, and the neck: so that if the figure stand on it's right leg, let the

of the disposition of the members, in turning the body round.

left knee be bent, and drawn backwards; it's foot a little raised, and spread outwards; and the left shoulder somewhat higher than the right: let the nape of the neck be turned directly over the outer ankle bone of the left foot; and the left shoulder hang perpendicularly over the toe of the right foot. Further, let it be a standing rule with you, never to turn the head of your figures the same way with the breast; nature having so contrived the neck, that it turns with ease, on every occasion of looking around us: lastly, to represent a man sitting, and at work with his arms, upon any thing side-wise of him, remember that his stomach be turned over the *joncture* of the haunch.

How to dispose
the members of
a single figure.

In a figure which you represent alone, observe, that no two members ever appear to have the same motion; for instance, if your figure be seen running by itself, let not both it's hands be thrown forwards, but if one be before, let the other come behind; for without this disposition, it will never be believed that it runs: if the right foot be advanced the foremost, let the right arm lag the hindmost; since without this *contrast* of parts, and this contrariety in their motions, a man never runs well, and with advantage. If another figure be introduced following the first, with one of it's legs advanced a little forwards, take care to bring the other leg underneath the head; and on the contrary, let the arm of the same side be reached out the foremost. Of this we shall speak more at large in our Treatise of Motion.

The most im-
portant parts of
the figure.

Your principal care in *designing* a figure must be, to set the head well on the shoulders, the *busto*, or trunk upon the haunches, and the haunches and shoulders upon the feet.

A fi-

• A figure standing firm on it's feet, makes an *equilibrium* of all it's members, around the central line, on which it is sustained. A figure, therefore, thus steady, and thus balanced, stretching one of it's arms out from the body, must at the same time shift so much of it's weight to the opposite side, as is equal to that of the extended arm: this must be understood of every part in general, falling out beyond ordinary from it's whole.

A man will never be able to lift a burthen till he lays a weight of his own, greater than that of the load he would lift, in opposition thereto.

The *attitude* of a figure must be so conducted, *of the attitude.* in all it's parts, as that the intention of the mind may be seen in every member.

The actions expressed in the figures of men, must be as various as are their ages and qualities; nor must even the sex be overlooked, but both male and female have their different *attitudes.*

A painter should remark the *attitudes* and motions of men, springing immediately from some sudden accident; and fix them well in his memory, or sketch them slightly on the spot. This will be infinitely better than to wait till some person mimick, for instance, the action of weeping, without any real occasion for tears. For such an action having no natural cause, the effect must of course be constrained and unnatural. It will, however, be serviceable to you in the highest degree, after having observed the circumstances of some natural action, to dispose a *model* in the same attitude: this will assist your imagination, and you will be enabled to paint

How a body preserves it's equilibrium.

How a figure lifts or bears a burthen.

Difference of attitudes.

How a painter may attain to give suitable attitudes to his figures.

paint from it, both with the greater ease and spirit.

Of the actions
of those present
at any remark-
able event.

Those who are present at any remarkable transaction, express their admiration in different manners; as for instance, in the execution of criminals. Where it is a matter of devotion, those who attend, cast their eyes on the object, with various expressions of zeal, resignation, and piety; as at the elevation of the host during the mass, and other the like solemn occasions. Where the subject is of such a kind, as either to provoke mirth and laughter, or sorrow and compassion, it is not necessary that the spectators should all turn their eyes towards the object; but they ought to appear with different emotions; and it may be convenient, in this case, to distribute them into several *groups* of persons, assembled together to vent their passions, either by laughing, or lamenting with each other. Where it is a subject that inspires terror and affrightment, those who are seen flying, must appear pale and aghast, with different expressions of fear and astonishment; their flight must be disorderly and precipitate, but differently characterized; as we shall have occasion to observe in our Treatise of Motion.

A rule in paint-
ing a nudity.

A figure, of a slender delicate shape, must never have it's muscles too bold and prominent; for men of this make have never much flesh on their bones, their slenderness arising from the want of it; and where there is but little flesh, the muscles can never have much *relievo*.

Whence the
muscles become
thick and short.

Muscular men have large bones, are short and thick in their shape, and have but little fat; the reason is, that the fleshy muscles, in growing, entangle one with another; so that the fat, which

which should insinuate itself between them, finds no room. Now the muscles in those bodies which are unfurnished with fat, being contiguous, and unable to dilate themselves, confine their growth to their thickness ; still growing the most in that part which is the furthest removed from their extremes ; that is, towards the middle of their length and breadth.

Though fat men have this in common with muscular men, that they are frequently thick and short ; yet are their muscles always small and slender. Now, their skin covering a great deal of soft, spungy flesh, replete with air, it comes to pass, that fat men swim better, and support themselves with more ease upon the water, than those who are thinner and more muscular ; the flesh of these latter being more solid, and including less air than that of the former.

As the arms are lifted up, or lowered, the breasts disappear, or become more prominent ; and as the haunches are bent, either outwards or inwards, their *relievos* undergo the same vicissitude. Further, the shoulders, the haunches, and the neck, are more variable than any other *jonctures* of the body ; their motions being more numerous and diversified than those of any other part : but of these, I propose a particular treatise.

The members of young people ought never to have their muscles too strong and prominent ; that being one of the characteristics of maturity and manhood, to which youth is not yet arrived. The muscles, however, must be touched with more or less force, as there is a greater or less stress laid on them ; those seen to make any vigorous effort appearing grosser and more inflated,

Remarks on the muscles.

flated, than the others which are out of action. By the way, let it be observed, that in members which are bent, the central line withinside, does never retain it's natural length.

A nudity, whose muscles do all appear bold and evident, ought to stand steady and without appear, must be without motion

A nudity, whose muscles do all appear bold and evident, ought to stand steady and without motion; it being impossible that the body should stir the least tittle imaginable, unless one part of the muscles be relaxed, while their antagonist muscles are in action: and it is evident that the slackened muscles must subside and disappear, in proportion as the others distend and discover themselves.

The muscles of a nudity never to be too exact and laboured.

In painting a nudity, be not too rigid and exact in marking the muscles; that being not only tedious and troublesome in the execution, but even displeasing to the eye when effected. Remember further, to make them the most visible on that side of any member which it puts forwards to action; the nature of a muscle being such, that in working, it's parts assemble and unite themselves together; several of them, by this means, discovering themselves, which before were unperceived.

Of the extensions and shortenings of the muscles.

The muscle behind the thigh shews a greater variety of extensions and contractions, than any other in muscle in the body; the next after this, is that which forms the buttocks; the third is that of the chine; the fourth that of the throat; the fifth that of the shoulder; and the sixth that of the stomach; which last has it's rise under the paps, and terminates under the groin.

The ligament of the wrist, without any muscle.

In the wrist of the arm, about three inches from the palm of the hand, is found a ligament, the largest which is without a muscle, of any in the human body. It has it's rise in the middle of

of one of the *fucils* * of the arm, and terminates in the middle of the other *fucil*: it's form is square, it's breadth three inches, and it's thickness one and an half; it's use being to keep close the muscles of the arm, and to prevent them from flying off in right lines, when the arm is contracted.

In some of the *junctures* of the body are found little bones, fixed in the middle of the ligaments, with which these *junctures* are bound together: these are found in the knees, the shoulders, the breast, and the feet, and are in number eight, viz. in each shoulder one, as many in each knee, and two in each foot, under the first *juncture* of the great toe, towards the heel. And let it be observed by the way, that these bones always grow extremely hard, as the person draws near to old age.

The muscle which rises between the breasts and the lower ventricle, or rather, which terminates in the lower ventricle, is found to have three powers; being divided length-wise by three ligaments, into so many parts; the first is the upper muscle, which is followed by one of the ligaments, as large as itself; below, is a second muscle, joined to a second ligament; and lastly, comes the third muscle, with the third ligament, which is fastened to the *os pubis* of the lower ventricle. This partition of the muscle by the several ligaments, is a provision which nature has made, on account of the great motion happening to the body, when bent or distended, by means of this muscle; since, had the muscle been all of a piece, it would have

Little bones
formed in the
ligaments of
some of the
junctures.

Of the muscle
between the
breasts and the
lower ventricle,

* By the two *fucils*, the author means no more than the *radius* and *cubitus* of the arm.

had too great an effect, and would have produced too great a variety of contractions and dilatations, in prejudice to the shape of the body, which is more beautiful, as the motions of this muscle are less apparent: for if it be required, that the whole muscle dilate itself nine inches, and that it afterwards contract itself as many; in this case, each of the three divisions, having but three of the nine to dilate, their natural form will not undergo any great alteration; and consequently, the general beauty of the body cannot hereby suffer any sensible diminution.

The greatest contortion of a man, in looking at his hind parts.

The utmost degree of contortion, to which a man, in viewing his hind parts, is able to reach, is, to have his face look perpendicularly down upon his heels: and this is not done without great difficulty; since, besides the flexure of the neck, the legs are likewise to be bent, and the shoulder, over which the head reclines, to be depressed.

How near the elbows may be drawn together behind the back.

When the arms are extended behind the back, the elbows stand at the same distance from each other, that is found, between the elbow and the end of the long finger; that is, the elbows at their nearest approach in this disposition, are just removed from each other, the space that is between the tip of the middle finger and that of the elbow; the two arms in this situation forming a perfect square: and the furthest reach of the arm across the stomach is then seen, when the elbow is found in the middle of the stomach; so as that the elbows, the shoulders, and the arms, form an equilateral triangle.

Of the disposition of the members, when a man is preparing to strike with violence.

A man, disposing himself to deal some violent stroke, bends, and turns from the mark at which he aims, with a motion contrary to that wherewith he intends to strike; where, collecting

ing all his force, he lets it fly ; and discharges it on the body that he hits, with a compound motion, formed out of that of the arm, and of the weapon that he holds.

The two muscles which serve to move the *fucil* of the arm, have their origin near the middle of the bone named *adjutorium*, one behind the other ; the office of the hindmost being to stretch the arm, and that of the other to contract it.

Now, to find which is the greatest force, whether that wherewith a man pulls towards him, or that wherewith he thrusts from him ; it must be observed, that in my Treatise *De Ponderibus*, I have already proved, that of two weights equally heavy, that will have the greatest force, which is the farthest removed from the center of it's ballance ; whence it follows, that *NB* and *NC* being two muscles of equal power ; *NC*, which is before, will have a greater force than the other *NB*, which is behind ; inasmuch as it is fastened to the arm in *C*, a place further removed from the middle of the arm, or from the elbow *A*, than *B*, which is just off the middle itself : so that the point is now determined. This, however, is but a simple power ; the compound power being what I now proceed to consider. By a compound power, I mean that which a man exerts, when, to the action of his arms, he adds some other secondary force, as the weight of his body, or the effort of his legs and reins. An instance of this power is shewn in the adjoining figures ; which are seen to struggle, the one to thrust, and the other to pull down a pillar ; each to that end, making a joint effort with his arms, reins, and legs.

In which action a man has the greatest strength, whether in thrusting or pulling.

The force wherewith a man pulls towards him, is considerably greater than that wherewith he thrusts from him. The reason is, that in pulling, the muscles of the arm, which are of no use in thrusting, join their powers with those of the other muscles, which serve indifferently in thrusting or pulling, and augment their force; whereas, in thrusting, the arm being stretched out strait, the muscles which give the elbow it's motion, are of no use in the action, making no effort beyond what would be made by the shoulder, if leaned against the thing to be moved: so that as there are no tendons nor muscles found to contribute towards that effect, excepting those, which when the reins are bowed, or the legs bent, serve to reduce them to their straitness again, and which lie under the thigh, and in the calf of the leg; it follows, that there being a greater number of powers which conspire, and act conjunctly in pulling, than in thrusting, the arms, the legs, the back, and even the stomach, (as the body is more or less bent,) contributing to the former, and the force of the arms being to be omitted, in the account of those acting in the latter; the action of pulling must carry with it a greater power, than that of thrusting: for it must be remembered, that though the same parts of the body concur to the one and to the other, yet, that the action of the arms is without effect in thrusting; the arm which is then stretched out strait, and without motion, being just equivalent to a stick, interposed between the shoulder and the thing to be thrust.

Of the flesh around the jointures which are bent.

The ligaments wherewith the *jointures* of the bones are covered, together with other things, encompassing or adhering to these bones, swell and subside,

subside, in proportion as the respective members are bent or extended; that is, they swell, and dilate within side the angle, formed by the bend of the members, and at the same time are stretched, and lengthened without side the said angle of the bend: the middle parts found in the bend, or between the outer or inner angles, partaking of the diminution of the one, or dilatation of the other; but in a greater or less degree, as they are nearer or more remote from the said angles of the *joncture*.

The leg cannot possibly be moved, either to the one side or the other, without turning the thigh at the same time: this is owing to the structure of the knee; for the bone of the thigh and that of the leg being inserted and fitted into each other, the *joncture* is at liberty to play backwards and forwards, so far as is necessary in walking, kneeling, and the like; but is utterly incapable of any lateral motion, by the very nature of the articulation. Now if this *joncture* was flexible on every side, like the *os adjutorium* in the shoulder, or that of the thigh, where it is joined to the haunch; the legs would be in a condition to be moved sideways, as well as backwards and forwards; and would usually be found across and twisted, to the no small hindrance of the man and his motions. Further, this *joncture* can only be bent forwards, so far as to straiten the leg, and to set it on a right line with the thigh; nor is it's flexure backwards unlimited; since, if it were, a man once down on his knees, would never be able to raise himself upon his feet again: for, in order to recover himself from this posture, we find that, in the first place, he discharges the weight of his body upon one knee,

The leg not to
be turned side-
ways without
the thigh.

and

and by that means eases the other; so that the other leg not being charged with any weight but it's own, easily raises the knee, and steps it's foot on the ground: this done, he returns back his whole weight upon this foot, by resting his hand upon his knee, and heaving up his arm, and with that his head and chest towards the other side; being now at liberty to distend the thigh, and to straiten it into a line with the trunk, he raises himself upright on the foot placed upon the ground; till, by that means, he erects the other leg, and sets it by it's fellow.

Of the wrinkles in the bend of a jointure. The flesh, in the bend of a *jointure*, is always wrinkled on that side towards which it is bent.

Of simple motion.

A simple motion is that which a man makes in bending simply either backwards or forwards.

Of compound motion.

A compound motion is that which a man performs, when, on any occasion, he bends both downwards and sideways at the same time. And here it may not be impertinent to advertise the painter to pursue his compound motions; and to make them appear quite through the piece he is painting: that is, having given any of his figures a compound *attitude* suitable to the subject of his history, let him never weaken it's force or expression, by accompanying it with the simple motion of some other figure less attentive to the matter in hand.

Of the motions suitable to the action in which a figure is employed.

The motions of your figures must always shew that degree of strength which they may be rationally supposed to employ in their respective actions; that is, a man in lifting a stick, ought never to exert the same effort which would be necessary to heave a beam. Remember, therefore, to proportion their several efforts to the quality of the work, and the weight of the burthens they bear.

Never

Never let the heads of your figures be seen of the motions
erected just in the middle of the shoulders, but ^{of figures.} always a little turned, either to the right or the left. This must be observed even where they are looking up or down, or even strait forward; it being absolutely necessary that they should have some *attitude*, to shew somewhat of vivacity, and to make it appear that they are neither dead nor asleep. Further, never *design* a figure entirely either in *profile*, in front, or even on it's backside, so as that the middle parts be seen ranged perpendicularly over one another; at least, if any particular circumstance should make this unavoidable, remember that it be done in the figures of old men; it being much more tolerable in these than in any others, on account of their natural dulness and inactivity. Lastly, never forget yourself so far as to repeat the same action of the arms or legs, either in the same figure, or even in those around it: with this proviso, however, that there be no particular circumstance in the subject that may make it necessary.

In a piece where a figure is represented shewing, or pointing with it's hand, at any thing not far removed, either in time or place; observe, that the arm be not too much extended, nor the hand that points at too great a distance from the person who directs it. But where the thing pointed at is far removed, then must the arm be likewise far stretched out, and the hand seen at a good distance from the body; the face of him that points being, at the same time, turned towards him for whose sake that action is intended.

The air of men's faces must be varied according to their various circumstances, and according

Of the gesture
of a man point-
ing at any thing

ding

ding to the various accidents that befall them; in working, resting, weeping, laughing, crying, being seized with fear, or moved with any other passion: and let it be further observed, that every member of the figure, together with its whole *attitude*, must have a natural connexion and correspondence with the passion expressed in the face.

Of the motions
suitable to the
intentions of
figures.

Of the motions of the soul, some are attended with actions in the body, and others are without any. Such as are accompanied with any action of the body, let fall the arms, the hands, and all the parts which at other times are the briskest and most active; on the contrary, those motions of the soul attended with actions of the body, animate the members, and dispose them into attitudes correspondent to the idea or intention of the mind. But this is a subject which must be considered by itself. There is, further, a third kind of motion, partaking both of the one and the other; and a fourth, perfectly different from them all. These two last kinds are those of a madman and a buffoon; and must be referred to the chapter of *grotesque* work.

The motions of
the body arising
from the senti-
ments of the
mind easy and
natural.

Those actions of the body, which are produced by the motions of the mind, are simple and easy, not wrested either to this side or that; because their object is in the mind, which never moves the senses when it is employed in itself.

Of the motion
arising from the
view of an object

The motion occasioned in a man, by the presence of any object, may be produced either mediately or immediately; if it arise immediately, the person who moves, in the first place, casts his eyes towards the object; his sight being the best able of his senses, to discover what

it

it is; letting his feet at the same time stand immovable, and turning his thighs, haunches, and knees, the same way with his eyes: thus, in every encounter of this kind, remember to be very curious and exact in remarking the most minute motions and gestures that arise.

The variety of motions in men, is as great as that of the accidents which befall them, and that of the fancies and imaginations, which pass successively through their minds. And every accident makes a greater or less impression, according to their different ages, passions, and complexions; the motions of a young man being always very different from those expressed, on the same occasion, by an old one.

Every two-footed animal lowers that part over the foot which is raised, more than that which is over the foot on the ground; his upper parts, at the same time, observing a quite contrary vicissitude. This may be seen in the haunches and shoulders of men, in walking; and in the heads, and rumps of fowls.

Observe that every part of a whole be well proportioned to the whole, of which it is a part; as if a man be thick and short in his shape, let the same proportion be continued through every member: let his arms, for instance, be thick and short, his hands broad and brawny, his fingers big, and their jointures suitable; and so of the rest.

Observe a decorum, or decency, in your figures; still making their actions, dress, behaviour, postures, &c. suitable and becoming to the dignity, or meanness of the persons represented. Thus, in the figure of a king, take care that the beard, the air of the face, and the garb, be grave and majestic; the place

S stately

Every member
to be suitable to
the whole of
which it is a
part.

Decency and
decorum to be
observed in
your figures.

stately and well adorned ; let his attendants appear full of reverence and admiration ; their mien noble, and their dress suitable to the grandeur and magnificence of a prince's court. On the other hand, in a scene of low life, let the persons appear mean and ill dressed ; let the behaviour of those about them be rude, and familiar ; and let every member be strictly conformable, both to the subject in general, and to the character of each respective figure in particular ; and remember even there to make the actions of old men unlike those of young ones ; those of women, different from those of men ; and those of children, different both from the one and the other.

Of the mixture
of figures differ-
ent in age, &c.

Never mix a certain number of children with an equal number of old men ; nor of gentlemen with servants ; nor of women among men : unless where the subject which you represent, makes this absolutely necessary.

Of the quality
of the persons
in a history-
piece.

Generally speaking, let there be but few old men seen in your history-pieces ; and even those that appear, ought to be separated from the young ones ; for, in effect, old men are but thin, and their humours have but little conformity with those of youth, and where that is wanting, there can be no great friendship, and without friendship, company soon separates. Thus, likewise, in grave and serious compositions, where assemblies are held, and matters of importance debated, let but few young men be present ; it being contrary to custom to intrust affairs of this nature in the hands of youth ; who are not less able to give counsel, than they are unwilling to receive it, and who therefore have two reasons for absenting themselves from these kinds of meetings.

To

To represent a person haranguing a multitude, consider, in the first place, the subject matter on which he is to entertain them, in order to give him an action suitable to the occasion: for instance, if the business be to persuade them, let it appear in his gestures; if it be to argue and deduce reasons, let him hold one of the fingers of his left hand, between two of those of the right, keeping the other two shut; let his face be turned to the assembly, and his mouth half open, so as that he may appear to speak; if he be sitting, let him seem as about to rise, advancing his head a little forwards; if he be represented standing, let him recline a little with his head and breast towards the people, and let the assembly be seen listening with silence and attention; let all their eyes be fastened on the speaker, and let their actions discover somewhat of admiration: let some old man be seen wondering at what he hears, with his mouth shut, his lips drawn close, wrinkles about the corners of his mouth, the bottom of his cheeks, and in the forehead, occasioned by the eye-brows, which must be raised near the setting on of the nose: let others be represented sitting, with their fingers clasped within each other, bearing up their left knee: another old man may be seen with his knees thrown across each other, his elbow leaning on his knee, and with his hand supporting his chin, which may be covered with a venerable beard.

To represent a man enraged, let him be seen tearing some one by the hair, forcing one of his knees against his side, and wresting his head towards the ground; appearing at the same time ready to strike him with his right arm, heaved up, and his fist clenched: further, he must

How to represent a person speaking to a multitude.

How to represent a man in a rage.

grind his teeth, his hair must stand on end, his eye-brows drawn down, and gathered close together, the sides of his mouth bent into an arch, the neck swelled, and full of wrinkles on the side that reclines over his enemy.

How to represent a desperate man.

A desperate man may be represented with the knife in his hand, wherewith he has stabbed himself, having first rent his cloaths, and torn his hair; let the other hand be employed in opening and augmenting his wound; let his feet be sprawling asunder, his legs somewhat bent, and his body staggering, and ready to tumble to the ground.

Of the motions made in laughing and crying, and their difference.

Between a person in laughter, and another in tears, appears no sensible difference in the eyes, the mouth, or the cheeks; but only in the form and disposition of the eye-brows; these being swelled, and drawn together, in him that weeps, and higher and more level in him that laughs. One may further shew a person who weeps, tearing his cloaths, or falling into such other extravagancies, as may be most suitable to the subject of his sorrow; for we find some people weep out of rage, others for fear, another out of excess of tenderness and joy, another out of suspicion, another through pain and torment, and another out of grief for the death of a relation or friend. Thus likewise must the degree and expressions of sorrow be varied; one man appearing abandoned to despair, another more composed and moderate, a third contenting himself with pouring out tears, while a fourth adds groans and lamentations; another may be seen with his eyes fixed towards heaven, his arms hanging down, wringing his hands, or clasping his fingers within each other; and another, out of apprehen-

prehension, shrugging up his shoulders to his ears. The eye-brows of every man in tears must be drawn up near their *junctures*, and approached close to each other, and the sides and middle of his mouth must be wrinkled downwards; a person laughing, on the contrary, having the sides of his mouth raised, and his eye-brows flat and extended.

The disposition of the legs, either in children or old men, ought never to be such, as may shew those parts in any quick motion, or make their actions appear too brisk and nimble.

It is not decent either for women or young people to be seen in an attitude where their legs are spread too wide from each other, that shewing too much freedom and assurance; whereas, on the contrary, legs drawn close to each other are indications of modesty.

Those who are about to leap are taught by nature, without any reasoning of their own, to hoist up their arms and legs with impetuosity; these parts obeying the *impetus*, and rising together with the rest of the body, till such time as the effort is expired. This *impetus* is attended with a quick extension of the body, which before was bent, like a spring, in the reins, the *juncture* of the thighs, the knees, and the feet; and the body, in this extension, describes an oblique line, inclining forwards, and at the same time rising upwards; thus the motion directed forwards, carries the body in that direction, and the motion intended upwards, heaves up the body on high; and these two, thus conjoined, describe a large arch, which is the line wherein a man is observed to leap.

A man

Of the postures
of children and
old men.

Of the postures
of women and
young people.

Of a man leaping.

Of a man throwing any thing from him with violence.

A man who would launch a dart, hurl a stone, or the like, with violence, may be represented in two different habitudes ; that is, he may be either seen preparing himself for the action, or performing the action itself. If you shew him in a preparatory state, remember that the haunch, over the foot which bears the body, be seen directly under the middle line of the breast and the hole of the neck ; and let the shoulder of the opposite side be advanced, so as to hang perpendicularly over the foot on which the body rests ; so that if the right foot support the body, let it's toe be seen perpendicularly under the left shoulder.

Why a man pulling any thing out of the earth, or darting it in, raises the leg opposite to the arm wherewith he acts, and acts and bends it in the knee.

A man who, in retiring, would tear any thing out of the earth, or dart it in, raises the leg opposite to the arm wherewith he acts, and bends it in the knee ; this he does to ballance himself on the foot which supports the body ; for without thus bending it, he could not possibly act, neither could he retire, without stretching it out.

Of the equilibrium of a body at rest and out of motion.

The *equilibrium* of a human body is of two kinds ; to wit, simple and compound : simple is that which a man makes in standing steady and immovable on his feet. In this situation, whether he stretch out his arms or remove them in any manner from his body, or whether he be seen stooping, his body being supported on one foot, still the center of his gravity will be found perpendicular to the center of that foot on which he rests ; and when his body rests equally on both feet, the center of his trunk will then be found perpendicularly over the middle of the line which divides the space between the centers of the two feet. By the compound equilibrium, we mean that which is made,

made, when a man loaden with some foreign weight, sustains it by means of different motions. An example of this you have in the figure of *Hercules*, who is seen stifling *Antæus*, by bearing him up from the ground, and squeezing him between his arms and his breast; in the conduct of which it must be observed, that so much of the weight of his own body is thrown behind the central line of his feet, as is equivalent to the weight added before the central line of the said feet by the sustension of *Antæus*.

When a man becomes weary with standing long on one foot, he eases the wearied leg by throwing part of his weight upon the other: this, however, is a position which ought never to be shewn in practice, excepting in the figures of old men or children, or at least in such as ought to appear feeble or fatigued; for this shews a weakness and wearifomeness of members, which does but ill suit with persons under other circumstances. A young robust man, therefore, must be always seen resting on one leg, and if he lean some little on the other, let it be only as a disposition for motion; to which it is a necessary preparative, because all motion arises from inequality.

Figures represented in a firm steady attitude, must have some variety in their members, to make a *contrast*; that is, if one arm be advancing forwards, let the other stand still, or be cast backwards; and if the figure be supported on one leg, the shoulder over that leg must be lower than the other. These are things never overlooked by men of judgment, who are always particularly careful to ballance the figures standing on their feet, so as to prevent them from

of a man stand-
ing on his feet,
and resting more
on one than the
other.

from tumbling headlong ; for in resting on one leg a man has no use of the other ; which being a little bent remains as if dead, and disabled for any purpose of supporting the body : so that so much of the body as is over this leg, must of necessity transfer the center of it's gravity over the *juncture* of that other leg, whereon the body is sustained.

Of the equilibrium of a man standing firm on his feet.

A man standing firm on his feet, either leans equally on both, or he loads one more than the other ; if he tread on both alike, he either loads them with the natural weight of his own body alone, or to that he joins the additional weight of some foreign burthen ; when they are laden with the natural and the accidental weight together, then the opposite extremes of his members are not found equally distant from the *junctures* of his feet ; and when he charges them simply with his bare natural weight, these extremes of the opposite members will then, on the contrary, be seen equally removed from the *junctures* of the feet. But of this kind of *equilibrium* I intend, hereafter, a compleat treatise.

Of local motion

The motion made by a man, or any other animal, in shifting from one place to another, will be so much the more, or the less quick, as the center of his gravity is more or less remote from the center of the foot which supports him.

Of quadrupeds, and their motion.

The height of four-footed animals varies more in those which walk than in those standing still ; and this variety is more or less considerable, as the animal is of a larger or less size. This is owing to the obliquity of the legs when they first touch the ground ; which raise the figure of the animal, when they come

to

to straiten and to stand perpendicularly on the ground.

One half of the breadth and thickness of a man can never be equal to those of the other half, unless the members appertaining to each have their motions perfectly alike and equal.

Of the relation
which one half
of the body
bears to the
other half.

Three several
motions in a
man who leaps.

In leaping, the motion of a man's head is thrice as quick as that of his heel, before the tip of his foot quit the ground; and twice as quick as that of his flanks. This diversity is owing to the opening and straitening of three several angles at the same time; the highest of which is that formed between the trunk and the thighs, forwards; the second, that of the thighs in their *juncture* with the legs, backwards; and the third is that forwards, which the legs form with the bone of the feet.

The memory is in no wise able to retain, nor even the imagination to conceive, all the several views and aspects of any member of an animal, be it of what kind soever. This may be demonstrated in the instance of a hand; for since every continued quantity is divisible *in infinitum*, the motion of the eye, [Tab. 2. Fig. 1.] looking at the hand, and descending from *A* to *B*, being a continued quantity, may of consequence be divided into an infinity of parts: now the hand always changing it's figure and aspect, as it's situation alters with regard to the eye, it will be seen under as many different aspects, as there are distinct parts in the motion; that is, the aspects of the hand are varied to infinity. And the result would be the same, if the eye, instead of being lowered from *A* to *B*, should be raised from *B* to *A*; or if the eye were fixed, and the hand had it's motion.

Every member
of an animal
capable of an
infinite number
of different
views.

T

If

Nature the foundation on which a painter ought always to proceed.

Of the judgment which a painter forms of his own, or other men's works.

The precautions necessary to enable a painter to judge of his own performances.

If you would become a proficient, and practise either with profit or applause, study nature; let her be your mistress, nor ever let any thing escape you, but what is authorized by her precept or example.

It is but an ill sign when a painter's knowledge does not go beyond his work; and yet it is worse when his work exceeds his knowledge; as it happens in those who are surprized in finding how well they have succeeded: but when the painter's knowledge and light surpass his work, so that he is not satisfied with himself or his endeavours, it is a very happy omen; and the novice who finds this disposition in himself, may rest assured that he is destined to be an able artist. It is true, indeed, a man of his turn will never do a great deal, and his performances will be but few; but then they will be consummate, and will bear the most rigorous *examen*, as well as challenge the most rational admiration.

It is past dispute, that the same fault is more clearly seen in the works of other men, than in our own: this furnishes us with an argument in favour of perspective, and renders it necessary for the young painter to qualify himself therein at his first setting out: his next business will be to get a perfect acquaintance with the proportions of a human body. He may then proceed to make himself a master of architecture; so much of it, at least, as regards the form and regularity of the outsides of buildings; and, whenever, in his future practice, he finds occasion for things in which he has had no great experience, let him not fail to observe nature, and to *design* them from the life. When he is at work, it may be of service

vice to have a plain mirror by him, wherein he may frequently survey his piece, which will be there represented backwards, and will appear as if it were the work of some other hand; for by this means he will be the better enabled to distinguish his faults. And, lastly, he will find his account in laying down the pencil, and retiring frequently to take a little diversion. For the mind, at his return, will be more free, and the judgment more clear and penetrating; whereas, a too assiduous poring jades the mind, and rebates it's edge; insomuch, that he will then not only be liable to commit the grossest blunders, but, which is worse, to overlook them, and to let them escape *impune*.

If, after imitating any thing from the life, you desire to know your success, and to see how near the copy approaches the original, take a mirror, and presenting it to the natural object, survey the image exhibited therein, and compare it very carefully with your painting. This method is very apposite; for if a mirror represent objects with *relievo*, painting does the same; painting has but a single surface, and a mirror has no more; the mirror and the painting do equally shew the appearances of things encompassed with light and shadow; and both the one and the other shew their objects as at a great distance beyond their respective surfaces. Now, since it is owned that the mirror, by means of lights and shadows, makes objects appear with *relievo*; and since it is further confessed, that among our colours there are some, whose lights and shadows are stronger than those exhibited in the mirror; it is evident, that if you do but manage them with the necessary art and address, your painting will like-

The use of a
mirror in paint-
ing.

wise appear as a natural object, represented in a large mirror. From the mirror you will learn the brights and obscures of every object, and among your colours you will find some brighter than the most enlightened part of your *model*, as on the contrary, others more obscure than the deepest of it's shadows; so that if your painting have all the perfection whereof it is capable, the object it represents must appear perfectly the same as it would, were it exhibited in a mirror: this, however, being allowed, that the latter be only viewed with one eye, for the reason already delivered in our 48th page.

What manner
of painting the
most excellent.

The best manner of painting is that which imitates the best, and makes the picture bear the greatest resemblance to the natural object it represents. This matching the painting with the life, will do but little credit to a certain set of painters, who seem to aim at reforming the works of nature; and who, in painting (for instance) a child of a year old, whose head, in reality, is one fifth part of it's height, are so over scrupulous, as only to make it an eighth part; and the breadth of his shoulders, which naturally is equal to the height of it's head, is stretched by these gentlemen to double that measure; thus reducing the proportions of an infant to those of a grown man. These people are so hardened and confirmed in their error, by practising, and seeing it practised so often, that they persuade themselves that nature herself must be in the wrong; or, at least, that those who imitate her must be so, for differing from them.

The first aim
and design of
a painter.

The great design of a painter is so to manage a plane surface, as that on it may appear a body raised and standing out from the said *plane*.

And

And he who, in this point, surpasses the rest, is the person to whom the palm of his profession is indisputably due. Now this pitch and perfection of the art arising from a just and natural dispensation of lights and shadows, usually expressed by the word *clair-obscur*; it follows that a painter, in being sparing of his shadows, where they are necessary, does an injury to himself, and renders both his name and his works contemptible in the eyes of the knowing, purely to purchase a false esteem among the crowd; who, having no notion of the *relievo*, never mind any thing in painting beyond the glare and pageantry of the colours.

In painting, it is much more difficult, and requires a great deal more thought and reflection, to give the shadows to a figure, than to design it's *contours*; this is easily proved, for the outlines of any object may be designed through a plane glass, situate between the eye and the thing to be imitated; but this invention is useless with regard to the shadows, on account of their diminution and the insensibility of their extremes, which, for the most part, are confusedly mingled with one another; as I have already shewn in my Treatise of Lights and Shadows.

The distribution of the lights and shadows requires more thought and address than designing the contours.

The light must be cast on your figures in such a manner as may be suitable to the natural place in which they are supposed to be seen: that is, if they be illumined by the sun, let their shadows be deep, and their lights wide and diffused, and let the shadows of all the bodies around be seen projected on the ground. If the figures be exposed in a thick cloudy air, make no great difference between the parts illuminated and those shadowed, nor let any shadows be

Rules for managing the lights of your figures.

be seen at their feet: if they be supposed in a chamber, let their lights and shadows be very bold, and well distinguished from each other, and let their shadows appear on the ground; but if the windows have shutters before them, and the walls be supposed white, then the difference between their lights and shadows must be very little, and but just perceptible. If they receive their light from the fire, their illumined parts must be reddish and vivid, and the shadows very deep, and those again which they project against the walls or on the ground, bold, and their extremities somewhat abrupt; and let these shadows be still enlarged as they are further removed from the body. If one side of any figure be illumined by the air, and the other, at the same time, by the fire, let the former be brighter than the other, and let the latter appear reddish, and nearly of the colour of the fire. Observe, in the last place, that your figures be generally illumined with a strong light, coming from on high, and especially the faces, which you *design* from the life; the persons whom you see in the streets receiving all their light from above: and know, that there is no man, with whose face you are so well acquainted, as that, did he receive the light from below, it would not puzzle you to know him.

Where a person
ought to place
himself to view
a painting.

Suppose *A B* a painting, [Tab. 2. Fig. 2.] and let *D* be the quarter, whence the light proceeds; in this case, a person placed between *E* and *C*, sees the painting at a great disadvantage, and cannot possibly judge either of it's beauties or defects; especially if it be painted in oil, or be covered with varnish; because that, receiving a lustre, will, in some measure, have

have the effect of a mirror; for this reason, the nearer you are to the point *C*, the less will you see of the painting; it being thither that the rays of light, received in at the window, are reflected from the painting; but between *E* and *D* you will be commodiously enough situated to view the said painting; and still in proportion as you approach nearer the point *D*, your place will become the better, since you will there be the least liable to the annoyance of these reflected rays.

It will be the most advantageous to have the point of view on the horizontal line, and to have that line placed in a level with the eye of a man of ordinary stature: now that is to be esteemed the horizontal line in the painting, where the farthest part of the level earth terminates, or where the eye loses the sight of the plane; the hills or rising grounds being out of the question, and not confined by this rule.

The reason why objects at any time appear smaller than they are in effect, is, that they are seen at a great distance; for, in that case, there being a great quantity of air interposed between them and the eye, and that naturally weakening the lights, of course, the minute particles of the bodies must be prevented from appearing distinctly to the eye. Figures of this kind, therefore, must be touched very slightly; as if the painter intended no more than an unfinished sketch: to do otherwise would be to go contrary to nature, whose practice ought ever to be religiously followed; for as we have already observed, an object only appears little on account of it's being far removed from the eye, and a great distance always supposes a great

How high to
place the point
of view.

Little figures
never to appear
bold and finish'd
ed.

great deal of air between; as a great deal of air ever diminishes the light, and prevents the eye from distinguishing the little parts of an object.

Of the grounds proper for figures. Since we find, by experience, that every body is encompassed with lights and shadows,

let me advise the painter so to dispose his figures, as that their illuminated parts be found on dark *grounds*; as, on the contrary, their shadowed parts on *grounds* that are more bright. The observation of which rule you will find to contribute very considerably to the *relievo* of figures.

Of lights and shadow, and in particular of the shadows of car- nations. To distribute your lights and shadows with judgment, consider well in what place the light

is most clear and shining, as likewise where the shadow is the strongest and most obscure. And take particular care, with regard to the *carnations* of young people, that their shadows be never seen to terminate too coarsely and abrupt; for their flesh not being firm, but soft and tender, is in some measure transparent, as may be seen in looking at the hand, when held between the eye and the sun; in which case it appears reddish, with a kind of luminous transparency. If you desire to know then how to suit a shadow to the *carnation* you are painting, make a trial with the shadow of your finger, holding it still nearer or further from the painting, as you desire your shadow to be lighter or more obscure; this being adjusted, you may copy that shadow.

Rules for country pieces. Trees, and all kinds of herbs, thick set with little branches, must have no great delicacy or tenderness in their shadows; and others with large leaves must occasion shadows proportionally large.

Since

Since it is impossible to represent an animal, without giving it members; and since every member, to appear such, must have a resemblance with that of some other animal; it follows, that to *design* any imaginary animal, you must give it the parts and members of a real one: for instance, if you would have it appear like a serpent, let it have the head of a mastiff, the eyes of a cat, the ears of a porcupine, the snout of a grey-hound, the eye-brows of a lion, the temples of a cock, and the neck of a tortoise.

How to make
an imaginary
animal like a
natural one.

In a street, running east and west, the sun being in the meridian, and the walls opposed to the sun raised so high, as to screen the bodies below from the solar rays, the air at the same time being not too much illumined, is found a very advantageous place for the disposition of figures; and they are there always seen to receive an uncommon grace and *relievo*: for the two sides of the face, in this case, participate of the obscurity of the two opposite walls; and the nose, with the rest of the face, looking to the west, will be illumined; so that the eye, which is here supposed to be placed at the end of the street, will at the same time see the sides of the face shadowed by the walls, and the front part enlightened. To this it must be added, that the shadows will not appear harsh and stiff in their extremes, but will fall off, and lose themselves insensibly; a circumstance which contributes very considerably to the gracefulness of the figure. Now the reason of this tenderness of the shadows, is owing to the light diffused in the air, which, striking on the pavement of the street, is reflected on the shadowed sides of the face, and

How to give a
grace and relief
to faces.

U tinges

tinges them with a faint lightness. Further, the light reflected from the tops of the houses, and received in at the end of the street, will illumine the face to the very source, as it were, of the shadows arising under it, weakening them by little and little, till they come to terminate on the tip of the chin, in a shadow almost insensible on every side. For example: suppose this light were *A E*, [Tab. 2. Fig. 2.] the line *F E* of the light, you see, illuminates that part of the face under the nose, the line *C F* only illuminating that under the lip, and the line *A H* that underneath the chin; so that the nose must needs be more strongly illumined than any other part, since it receives light from all the points *A B C D E*.

How to raise
and loosen a
figure from it's
ground.

If your figure be obscure, bestow it on a bright *ground*, and if it be bright, let it be seen on a dark *ground*; if it be both bright and obscure, let the bright part be found on a dark *ground*, and the part that is obscure, on a *ground* that is bright.

The different
effects of lights
as they are dif-
ferently large.

A little light illumining a body, occasions the shadows on the unillumined side to be large, and very bold in their extremes; as, on the contrary, a large light makes the shadows on the same side of the body, smaller and less distinct in their bounds. When a little, but strong light is inclosed in another more large, but more feeble withal, as the sun in the air, the weakest will in that case have the effect of a shadow on the bodies illumined by it.

Disproportions
in the circum-
stances, and less
considerable
parts of a paint-
ing, to be a-
voided.

It is very ridiculous, but at the same time very common, for painters, to be overseen in proportioning the circumstances of their work: thus, for instance, we frequently see houses so exceedingly scanty, and their doors so miserably

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Pl.15.



bly low, that they scarce reach to the knees of their inhabitants, though they be even supposed nearer the eye of the spectator than the persons who are to enter within them ; thus cities and towns are sometimes so pitifully little, that one of the figures behind might stride over them with ease. And we have seen *porticos* more than once crowded with people, and yet supported by such slender pillars, that one of the figures has appeared with some of the pillars in his span, raising himself up as with an ordinary stick. But these, and several other faults of this kind, are to be very studiously avoided.

The outlines or *contours* of bodies are so faint and indiscernable to the eye, that they lose themselves at the smallest distance, between the eye and the object : thus a man cannot distinguish the face of his nearest friend by the *contour* ; nor has he any other way to know him but by his dress, air, and other circumstances ; thus arriving by the knowledge of the whole at that of the part.

The first things which disappear in dark bodies, when removed from the eye, are their terms or *contours* ; at a little further distance, the shadows, which divide the parts of contiguous bodies, cease to be seen ; further yet, the thickness of the legs and feet begin to dwindle ; and lastly, the smallest parts disappear by little and little, till, at length, the object being removed to a great distance, appears no other than a dim confused mass, without any thing distinct in it's figure or parts.

The first thing which the removal of an object occasions to disappear in it's colours, is their lustre, as being by far their most subtil

U 2

part,

of the extremes
of a body called
profiles or con-
tours.

The effect of
the removal of
an object, with
regard to the
design.

The effect of
the removal of
objects with re-
gard to the co-
lours.

part. The second thing which disappears, or rather which weakens itself in being removed, is the light, because it is less in quantity than the shadow. At the third distance, the principal shadows begin to fail; so that, at length, nothing remains but a general and confused obscurity.

The effect of
one body boun-
ding on another.

A body of a convex surface, terminating on another body of the same colour with the first, the term or contour of the convex body will appear more obscure than that of the other body on which it terminates. With regard to flat surfaces, their term will appear obscure, on a white *ground*, and on a dark ground it will appear brighter than any other part of the surface; even though the light, wherewith it is illumined, have an equal force on every part.

Of a man walk-
ing against the
wind.

A man walking against the wind, when it blows pretty strong, does never keep the center of his gravity, or line of direction, in the usual disposition, over the center of the foot on which his body is sustained.

Of the window
at which a pain-
ter works.

Let the window, at which a painter works, have a sash of oiled paper before it, without any bars running across the sash; these bars being of no use but to shut out part of the light, and to project shadows, which may give him some trouble in the execution of his work. It will be of use, likewise, to tinge the extreme parts of the sash, with some obscure colour; making it fall off gradually, as it advances from the extremities of the sash; so that the bounds of the light may not be the same with those of the window.

Why in measur-
ing a face, and
painting after

Having measured a face, and painted it exactly according to the measures, you will find the

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Pl. 16.



p.148.



P.147.



the painting appear larger than the life; the reason take as follows:—*AB* is the breadth of the space taken up by the portrait, [Tab. 2. Fig. 4.] which is placed at the distance marked *CF*, where the cheeks are; and must have the whole length of the line *AC* behind; now in this case the temples will be seen at the distance *OR* of the lines *AFB* *F*, so that they will appear narrower than the life, by the two spaces *CO* and *RD*: whence it follows, that the two lines *CE* and *DF*, to become more short, must join the plan on which the whole height is *designed*; that is, the lines *AE* and *BF*, where the true bigness is found: so that the difference, as we have already mentioned, lies in the two spaces *OC* and *RD*.

A white object being placed between two walls, the one whereof is black and the other white, the same proportion will be found between the enlightened and the shadowed parts of that object, which the two walls are seen to bear to each other; and if the object were of an azure colour, the effect would be the same: so that if you should have occasion to paint such an object, take the following method; to give the object, which is here supposed to be azure, it's proper shadows, take a black, like the blackness of the shadow, supposed to be reflected from the wall upon the object; and to proceed on the surer principles, observe what I am now about to deliver. Of what colour soever the walls are to be painted, take a little spoon, larger or smaller, as the occasion may require, having it's brim of an equal height all around; and with this, measure, very exactly, the several simple colours necessary to form your compounds. Thus, for instance, if you have

How the surface
of every opaque
body partakes
of the colour of
it's object.

have given the principal shadows of the wall three degrees of obscurity and one of brightness, that is, three spoons full of black mingled with one of white, your mixture will be fixed and determined. After having then made one wall black and another white, and have an azure object to place between them, which you would bestow the lights and shadows, proper to that azure; place on one side the azure colour which is to remain clear and without any shadow, and the black by it; then take three spoons full of black, and mix them with one spoonful of bright azure, which mixture must serve for your deepest shadow. This done, consider the form of your object, whether it be spherical, cylindrical, square, or otherwise; if it prove spherical, draw lines from the extremes of the dark wall to the center of the said sphere, and between the points where these lines cut the surface, dispose your deepest shadow; after this, observe to illumine or alleviate your shadows by little and little, in proportion as you remove from the extreme of the strongest shadow; as for example, in *NO*, [Tab. 2. Fig. 5.] still weakening the shadow in that place, in proportion as it participates of the light of the upper wall *AD*: and this colour you must join to the extremity of the principal shadow of the second line *AB*, in the same manner, and with the same regulations already laid down for the first.

Of the motion. That figure will appear to run the fastest, which seems in a posture the most reclining, and the likeliest to tumble forwards.

Of animals, and in particular of the flight of birds. A body moving itself will have so much the greater velocity, as the center of it's gravity or line of direction is further removed from the

the center of that part on which the body is sustained: this we mention principally with regard to the motion of birds; which, without any wafting of their wings, or any assistance from the wind, are frequently seen to sail though the air. Now this happens when the center of their weight is out of the center of their support, that is, out of the middle of their wings: since, if the middle of the two expanded wings be behind the middle or center of the bird's weight, the motion of the bird will, at the same time, be both forwards and downwards; but then it will be so much the more or less forwards, than it is downwards, as the center of it's gravity is more or less remote from the middle of it's wings; that is, the center of gravity being removed from the middle of the wings, the descent of the bird is thereby rendered more oblique; and, on the contrary, as that center approaches nearer the middle of the wings, the direction of the bird's descent will become more perpendicular.

It is no difficult matter for a painter to represent a figure forty fathoms high, standing erect on it's feet, in a space of only half that height; since neither in this, nor in any other case, need he trouble himself about the wall on which he paints; and especially when his work is to be viewed from a window, or some other determinate place; because the eye is not to concern itself with the evenness or curvity of the surface on which the painting is made, but only with the force and conduct of the things represented in the painting. It will be convenient, however, to chuse a surface that may be a regular curve, as for instance, *F.R.G.*; [Tab. 2.

A figure may appear forty fathoms high, which yet is painted on a wall of half that height.

Fig.

Fig. 6.] since, in that case, your work will be free from the interruption of angles.

How a painter may design a figure that may appear twenty-four fathoms high, on a wall of half that height, only twelve fathoms high.

To paint a figure which may appear twenty-four fathoms high, on a wall of half that height, observe what follows: let one half of your figure be *designed* on the wall *M N*, and the other half on the arch *M R*; in order to which, take the ensuing method: in the first place, on some convenient place trace out a wall with an arch, of the same form, and in the same proportions, with those whereon you are to paint; this done, place a *model* of your figure, *designed in profile*, and of what bigness you please, behind this imaginary wall, drawing lines from every part of it to some fixed point, as *F*, and observing in what places they cut the same supposed wall, *M N*, that you may be afterwards enabled to set them off on the real one: by this means, you will find all the heights, juttings out, and the several remarkable points in your figure: as to the breadths and thicknesses, those which are projected on the strait wall *M N*, will be found in their due dimensions, the figure being sufficiently diminished by it's distance from the wall: but that part of the figure which enters the curvature of the arch, must have it's breadths and thicknesses further diminished, in the same manner as if it were strait; and to proceed the more surely, it may be convenient to mark out this diminution on some even plane, where you may lay your figure, taken off from the feigned wall *N R*, to be afterwards transferred in it's just proportions to the real wall. This is a method which I dare venture to recommend as the best, and the most secure that can be used on these occasions.

Observe

Observe, that where your shadows terminate, there be always an appearance of a half shadow, that is, a mixture of light and shadow; and that the shadow be more perfectly mingled with the light, as it is further removed from the dark body which projects it. Now that colour of a body is never seen simple; this I have already proved on this principle, that the surface of every body partakes of the colour of it's object; even though it be the surface of a transparent body, as water, air, or the like: for air borrows light from the sun, and darkness from the upper regions; and further, it is seen tinged with as many different *dies*, as there are different colours between which, and the eye it is interposed. Now though the air, like water, and other transparent bodies, has no colour of it's own; yet the moist vapours emitted from the earth, and received into the lower regions of the atmosphere, thickening and constipating that part of the air near the earth; the sun-beams, in their passage through it, leave part of their light; being unable to make their way through so gross a medium, without being reflected every way: so that the upper regions of the atmosphere, at the same time, remaining dark, the air hence becomes tinged with azure, that being the result of light and darkness mingled together; and the brightness or obscurity of this azure will be found to vary, as the air is more or less charged with these humid exhalations.

In a piece where you introduce any multitude of figures, either of men, or other animals, observe that their parts appear so much the more obscure, as they are lower, and as they are further involved in the croud. Now this is

Remarks relating to lights and shadows.

absolutely necessary; there being a less portion of the heavens, wherewith these bodies are supposed to be illuminated, received within the lower parts of the space between the said bodies, than within those which are higher; as will appear from the following example: suppose *A B C D* an arch of the heavens, [Tab. 2. Fig. 7.] diffusing light on the bodies beneath, and *M N* two bodies, bounding the space *S T R H*, included between them: it here appears evident, that the point *F* must be less illuminated than the point *E*, the latter receiving light from the whole arch *A B C D*, and the former only from a part of it, *C D*.

Of a plane surface on a ground of the same colour with itself.

Of the difference with regard to painting between a surface and a solid.

A plane surface, uniform in it's light and colour, will never appear loose and distinct from a ground whose light and colour are the same: on the contrary, therefore, they will stand loose and free from each other, when their light and colour are found different.

Regular bodies are of two kinds; the one have surfaces, that are either spherical, elliptical, or curved in some other way; the other have several sides or faces, which form so many several surfaces, separated from each other by angles; and these bodies are either regular or irregular. Now a spherical, or an oval body will always have a *relievo*, and appear raised from it's *ground*, even though both the *ground* and the body have the same colour; and the same thing may be observed of polygons, or bodies of many sides: the reason is, that they are naturally disposed to produce shadows on one of their sides, which is what a bare, flat surface is incapable of.

The smallest parts of an object are those which, in it's removal from the eye, disappear the first.

Among the parts of any body removed to a distance from the eye, that which is the smallest,

lest, will disappear the soonest; whence it follows, that the largest parts will be those which hold out visible the longest: for this reason, a painter must never make the small parts of distant objects distinct and finished; but ought rather to follow the rules which I have elsewhere laid down for these occasions. And yet how many painters do we see, who, in representing cities or other objects far distant from the eye, make the *designs* of their buildings as bold and finished, as if they were seen in the next neighbourhood. Now this is to go contrary both to reason and experience; for where is sight so quick and penetrating, as to discern the bounds and last extremities of bodies, even at a moderate distance? Remember, therefore, to touch the *contours* of remote objects very slightly; and observe further, that in painting far distant bodies, you never tinge them with so strong an azure, as that it may have a contrary effect, and make them appear near at hand: take care, lastly, that in representing a city seen afar off, you never make the angles of the buildings appear; since those angles being formed by the concourse of two lines in a point, and a point having no parts, it cannot be supposed that they should be visible at a distance.

A champaign sometimes appears larger, and at other times smaller than ordinary; this is owing to the air interposed between the eye and the horizon, which at some times is grossest, and at other times more subtil than usual.

Among several horizons equally distant from the eye, that seen through the grossest air, will appear the most remote; and on the contrary, that will seem the nearest, which is seen through an air the most subtil.

Why the same champaign appears larger at some times than at others.

Objects of unequal bulks, and seen at equal distances, will appear equally big, when the several airs, through which they are seen, bear the same proportions with regard to grossness, which the unequal bodies bear to each other with regard to bigness: with this restriction, that the grossest air be found between the eye and the smallest body; and the rest in the same order. Now, this may be proved by the perspective of colours; by means of which, a mountain, which would be found very small, should you come to measure it, is nevertheless made to appear larger than a hillock, which is seen nearer the eye, and whose dimensions are considerably larger; just as a little finger held near the eye, is found to cover a large mountain, when further removed.

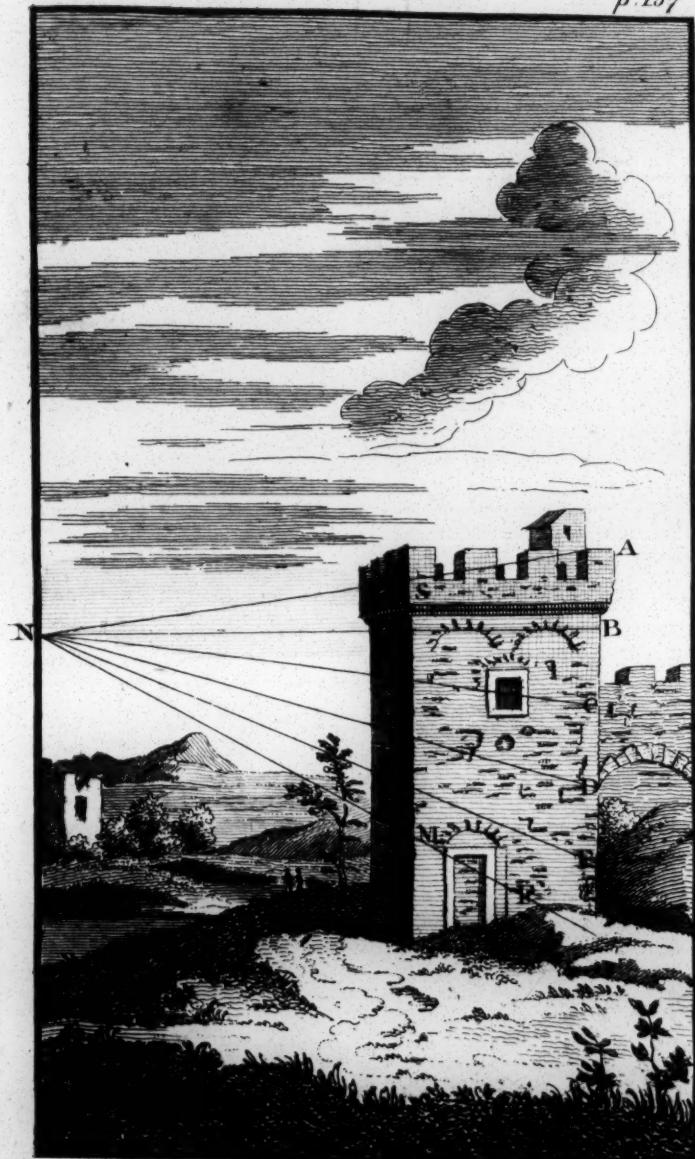
Miscellaneous
observations on
perspective and
colours.

Among bodies of equal obscurity, bigness, figure, and distance from the eye, that will appear the smallest which is seen on the whitest *ground*, or in the most luminous place: this may be observed in looking at a tree stripped of it's leaves, and illumined by the sun, on the side opposite to that whereon you look; for in that case, those branches of the tree which face the sun, will be diminished to that degree, as almost to become invisible: and the same thing will be found in holding out a pike, or other long pole, strait between the eye and the sun.

Parallel bodies placed upright, and seen in a fog, will appear larger towards the top, than near the bottom: the reason is, that the foggy air, being penetrated by the rays of the sun, will appear by so much the whiter, as it is the lower.

Bodies





Bodies seen at a distance appear ill proportioned: this happens, because the brighter parts send their images to the eye stronger and more sensible, than those emitted from the obscurer parts; and I once observed, in looking at a woman who was dressed in mourning, that her head, which was covered with a white hood, appeared twice as large as her shoulders which were black.

The eye looking at a city in a foggy season, or when the air is rendered gross by smokes or other vapours, the buildings will appear less sensible as they are less elevated; and, on the contrary, they will appear the clearer and more distinct, as they are seen at the greater height. This follows from what we have already proved, *viz.* that the air is more gross as it is lower, and more subtil as it is higher, and may be exemplified in the following figure; where the tower *A F* is seen by the eye *N*, in a gross air *B F*, which is divided into four degrees, each more dense, as it is nearer the earth.

By how much there is less air interposed between the eye and the object, by so much will that object partake less of the colour of that air: whence it follows, that as the greater quantity of air is found between the eye and the object, the object must appear more tinged with the colour of the air. Now that may be thus demonstrated: suppose *A E* a tower, and *N* the eye, receiving the species of the five parts of the said tower *A B C D E*: now if the air were of the same density throughout, there would be found the same proportion between the degree of azure, contracted by the foot of the tower *F*, and the degree of azure, which

the

Of cities and
other objects
seen in gross air.

the said tower contracts at the part *B*, that the length of the line *M F* bears to the length of the line *B S*: but since it is shewn in the former proposition, that the air is unequally gross, and that it is denser as it is lower, it follows, that the proportion between the colours which the air conveys to the tower at different elevations, must exceed the proportion of the lines; since the line *M F*, besides the excess of it's length, passes through an air more dense than that of the line *B S*.

Of the rays of the sun passing through any chasm or vacuity interposed between the different densities of clouds illumine every place through the interstices of clouds.

The rays of the sun passing through any chasm or vacuity interposed between the different densities of clouds illumine every place as they pass, and tinge even those which are obscure with their brightness; the only dark parts remaining, being those which are found between the interruptions of the said rays of the sun.

Of objects seen in a mist or thick air.

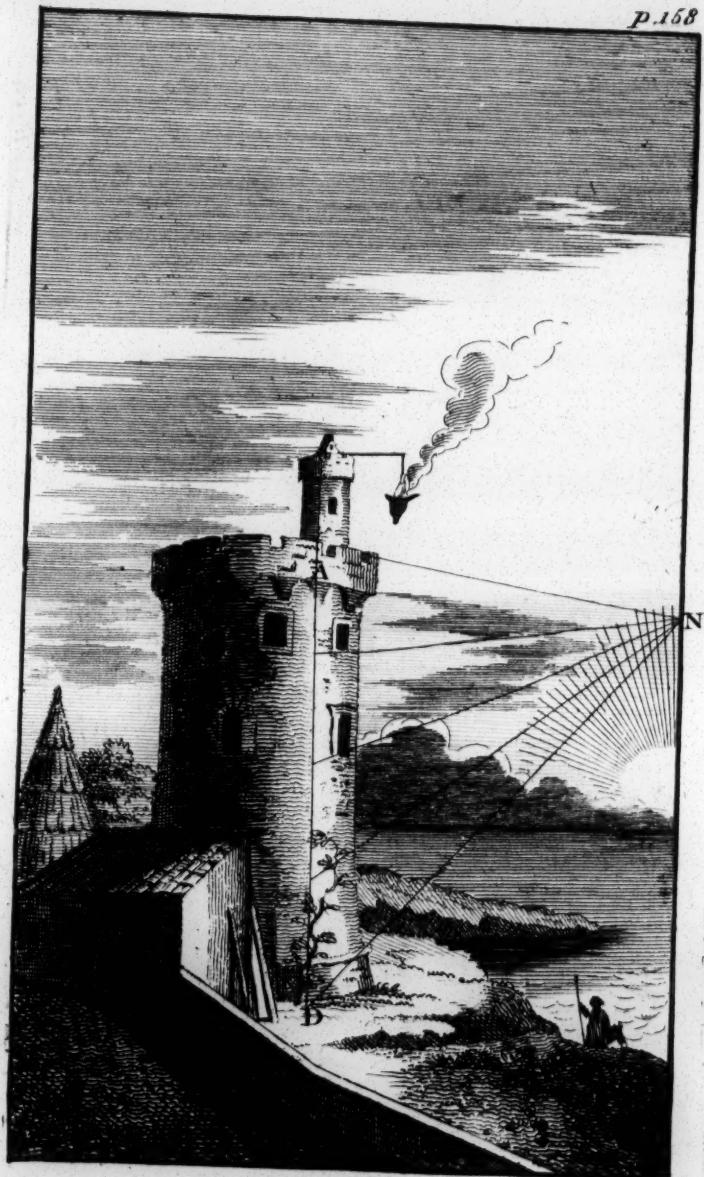
By how much the air is nearer the earth or water, by so much it is the more gross; this follows from a proposition which I have elsewhere demonstrated, *viz.* that a heavy body raises itself less than a light one; whence, by the rule of contraries, it follows, that a light body raises itself higher than a heavy one.

Of buildings seen through a gross air.

That part of a building which is found in the grossest air, will be the least sensible, and will shew itself the least; and, on the contrary, that part found in the purest air, will appear the most visible and distinct. Thus, if you suppose the eye *N* looking at the tower *A D*, every part will be seen the more confusedly in proportion as it approaches nearer the earth; and more clearly and distinctly as it is further removed from it.

Every

p.168



N

Pl.20.



Every obscure object will appear so much the more clear and bright, as it is further removed from the eye; of course, therefore, the same object will appear so much the more obscure, as it is seen at a less distance: hence it follows, that the lower parts of an object, seen in a thick air, will seem further removed than its top; so that the bottom of a mountain will, in appearance, be further distant from the eye than its summit, and yet, in reality, it is the nearest.

The eye viewing a city enveloped in a gross air, will find the tops of the buildings obscured, and, withal, more distinct than the parts beneath; for the latter will be seen on a whiter *ground* than the former; inasmuch as they are found in an air that is lower and more gross.

The lower bounds and extremities of far distant objects will be less visible than the upper: this is very observable in mountains, whose tops have for their *ground* the sides of some other mountains rising behind them; for here, the basis being encompassed with a grosser and more illumined air, must of course be less distinct and determined than the summit; so that the top will be very evident and discernable, the root all the while being dim and indistinguishable. The same things happen with regard to trees, buildings, and all other bodies rising high into the air; and hence it is, that looking from a great distance at any very tall tower, we see it larger at the top than the bottom; the thin and less lucid air, wherewith the top is surrounded, leaving more room for the minute parts to appear, than the grosser and more luminous *medium*, investing the foot of the same building; as I have elsewhere shewn

Of the lower bounds or extremities of remote objects.

on

of objects seen at a distance.

on this principle; that a gross air diffusing a whiteness on objects, enfeeble their images; whereas a more subtil air, in tinging objects with azure, takes off less of their force, and weakens their impression, but in a less degree. Of this we have a very sensible instance in fortifications; wherein, the intervals between the battlements and the extent of the battlements themselves are mutually equal; and yet at a moderate distance from the eye, the intervals appear considerably larger than the battlements; at a yet greater distance the battlements are extremely diminished. Lastly, the distance is sometimes so great, that the battlements entirely disappear and become invisible; so that the wall appears full and even, without any gaps or interruptions at all.*

Of remote objects.

The terms or *contours* of objects appear less distinct, as they are seen at a greater distance.

Of the azure of remote objects.

Among objects far distant from the eye, be their colours what they will, that which has the greatest share, either of natural or accidental obscurity, will appear of the deepest and the strongest azure. Now natural obscurity is that arising from the proper colour of the body. By accidental obscurity, we mean that derived from the shadows of other bodies.

What parts of a body are the first which disappear at a distance.

Those parts of a body which are the most minute are found to be the first which disappear at a distance from the eye: the reasons are, that unequal objects being placed at equal dis-

* This instance is fetched from the ancient fortifications, wherein the walls being of stone, and being likewise bleached with the weather, were usually whiter than air.

tances,

stances, the smallest will be seen by the eye under the acutest angle; and that our knowledge or discernment of bodies is more imperfect, as their bulk is narrower and more confined. It follows, therefore, that when a larger bulk is so far removed, as that the angle which it subtends at the eye is so acute as to be but barely perceptible, a quantity still less must be entirely lost, and remain wholly invisible.

The further any object is removed, the less we know of it, and the more imperfectly do we distinguish what it is. The reason is, that the smallest particles of objects disappearing the soonest, and the larger becoming invisible at a yet greater distance; the object being removed further and further, its parts are more and more dissipated, till at length all the parts, together with their whole, vanish and disappear: the colour itself being lost and effaced, by means of the air interposed between the eye and the object.

Visible objects make no impression on the sense, but by the images or species which they send to the eye: these images are nothing but rays of light issuing from the *contours*, and other parts of the object, which passing through the air, meet on the pupil of the eye, and there form an angle. Now as there are always vapours in the air, which surrounds us, it happens that several of the rays never reach the eye, being broken and intercepted in their passage; inasmuch that, at a great distance, so many of these rays are lost, that the image comes maimed and imperfect, and the object, in consequence thereof, appears confused and obscure. Add to this, that the organs of sight

Why bodies are
less distinguish-
able at greater
distances.

Why faces and
other objects
become obscure
at a distance.

are frequently indisposed ; so that the rays of light failing of their ordinary impression, the object appears dim and indistinct.

Which parts of bodies removed to a distance disappear the first, and which the last.

In removing a body to a distance from the eye, that part which is smallest will discontinue it's appearance before that which is larger. This is observable in the minute particles of bodies, and in the slender limbs of animals ; for instance, in the horns and legs of a deer, which are lost to the eye, at a much less distance than it's body. In general, however, it may be observed, that the first thing which disappears in an object is it's *contour* which bounds it, and which determines it to be of that figure.

Of linear perspective.

Linear perspective consists in representing, by lines and strokes, the figures and bignesses, under which objects are seen, at their respective distances ; to this end determining how much the bigness of an object is diminished, and how far it's figure is altered, at it's several degrees of distance, till it come entirely to disappear. Now experience has taught me, that in viewing several bodies, equal in bulk, and ranged at equal distances from each other, the first will appear twice as big as the second, and that second twice as little as the first, and twice as big as the third ; and so of the rest : observing, however, that this does only hold upon the supposition, that the eye be placed at the same distance from the first, that the first is placed from the second ; and that this distance do not exceed twenty fathoms ; for beyond twenty fathoms the equal figure will lose three fourths of it's bigness ; and beyond forty fathoms, it will lose nine tenths, and nineteen twentieths at the distance of sixty fathoms. And thus the diminution will always keep the same proportion,

as

as the distance grows greater. Now to apply what I have here said to your use in painting, observe that you be removed twice your breadth from the piece you are upon ; for if you be only placed at half that distance, it will make too great a difference between the first fathoms and the second.

Those objects, which are seen shrouded in a fog, appear considerably larger than they are in reality : this is owing to the perspective of the *medium*, interposed between the eye and the object, which does not proportion it's colour to it's magnitude ; or, in other words, it is owing to the grossness or resistance of the fog, by means of which the natural colour of the object is weakened and altered beyond it's due proportion ; that is, the diminution of the angle under which the eye sees the object, at that distance, is not equal to the diminution of the colour of the said object, occasioned by it's being seen through that *medium*. So that the object, which we here suppose at half a mile's distance from the eye, will yet be as far removed in appearance, as when seen on the edge of the horizon, in a clearer day. Now, you know that a tower seen at this latter distance, appears no taller than a man ; it is no wonder, therefore, if the magnitude of the fore-mentioned object be augmented ; since, while it's real distance is but half a mile, the eye judges of it from it's apparent distance, which is vastly greater.

That part of any neighbouring building will appear the most confused, which is seen at the greatest distance from the earth : the reason is, that there being more dense cloudy air between the eye and the ridge of the building, than

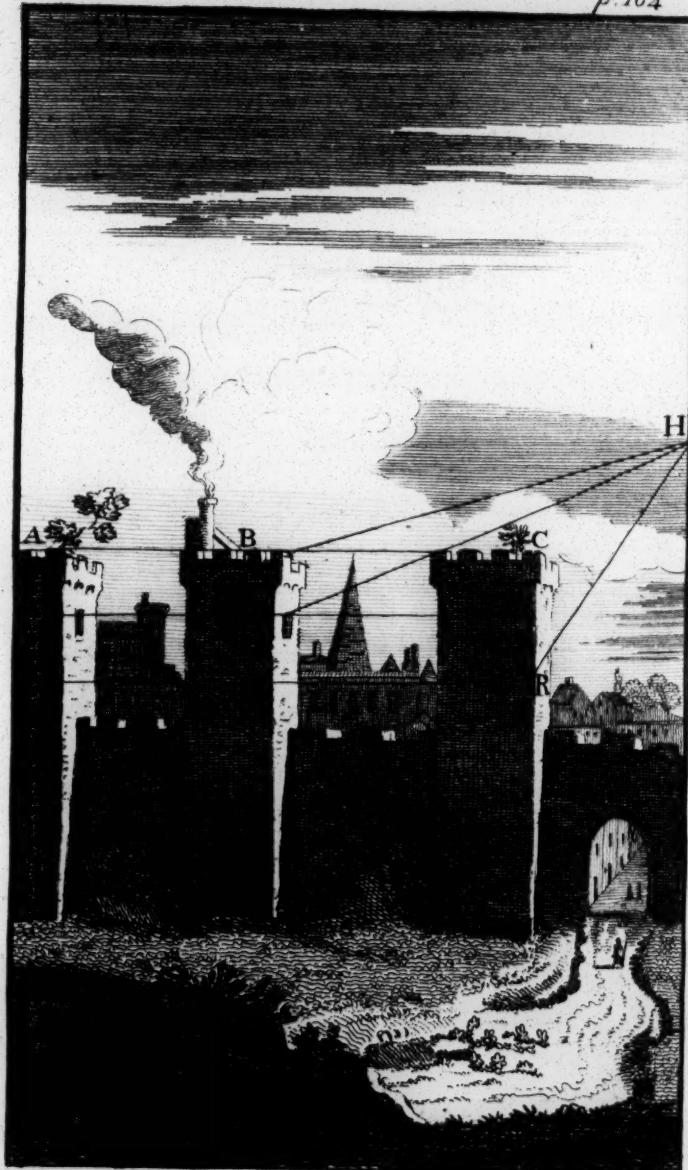
between the said eye and the bottom of the building, the image of the latter must be more weakened and disordered in it's passage, than that of the former. Nor must it be forgotten, that a tower, whose sides are parallel, being seen at a distance, and in a foggy air, will appear narrower and more contracted, as it approaches nearer it's *basis*. This happens, because, as we have already shewn, the air becomes more gross as it is nearer the earth, and more white as it becomes more gross; and because every obscure object appears smaller, as the ground on which it is seen is more white: for the *medium* being whiter, near the foot, than the top of the tower, it follows, that the building, on account of it's obscurity, must appear smaller and narrower towards it's extreme, than towards it's upper parts.

Of buildings seen in the morning or evening through a gross air.

In buildings which are seen from afar, either in the morning or evening, the weather being foggy, or the air very gross; those sides alone become visible, which are turned towards the horizon, and illumined by the sun: the other parts of the buildings, unillumined by the sun, remaining almost of the colour of the fog, and scarcely to be distinguished from it.

The highest objects seen at a distance and in a fog, appear more obscure than those which are lower.

Among bodies seen in a fog, a cloud, dense air, vapour, smoke, or only at a great distance, that will appear the most visible and distinct which is the most elevated; and among things equally elevated, that which is found in the obscurest fog will appear the most obscure. Thus, the eye *H*, viewing *A B C*, three towers of equal height, it will see the top *C* of the first tower as low as *R*, which is found merged two degrees within the fog; and the top





top of the middle tower *B* will be seen in the same fog ; but then, so much of it as appears to the eye *H* will not be sunk beneath one degree of depth ; so that the top *C* will appear more obscure than the top *B*, and that again more obscure than the top *A*.

The neck of a man, or the like part of any other body, raised perpendicularly, and covered with the prominence of some other part, will appear more obscure than the face, or side perpendicular to the part so prominent. This follows from an axiom which will be easily allowed, *viz.* That every body will be the more illumined, as it receives light from a greater share of it's luminous body. Thus, in *Tab. 2. Fig. 8.* the point *A* is not illumined by any part of the heavens *KF*, the point *B* is illumined by the part *KH*, the point *C* by the part or arch *GK*, and the point *D* is illumined by the entire arch *KF*; so that the stomach will be found equally enlightened with the forehead, the nose, and the chin; the points *C* and *B*, at the same time, being less enlightened, and the point *A* none at all. Now, with regard to faces, it must be observed, that at different distances, their several shadows disappear ; none being at length found remaining but those of the orbits of the eyes, and of some other the like parts : and further, that at a great distance the shadows do all cease to be seen, the lights which should shew them being weakened, and at length entirely lost, by reason of their smallness, and the disproportion they bear to the shadows ; so that the whole face becomes obscure, and appears invested with one general half-shadow. Not that there is any real alteration either in the lights or shadows themselves ; for the effect

is

Of the shadows
seen in bodies
viewed at a dis-
tance.

is wholly owing to the distance, which weakening their force and impression, disables them at last from distinguishing themselves ; so that mingling together, they form what we call a half-shadow. Thus, it is distance in like manner, which makes trees and other bodies appear more obscure than they are in reality : and thus it is distance which occasions that azure colour wherewith all remote bodies appear, and which is seen the most sensibly in the shadowed parts ; those more illumined, being more able to preserve their native colours genuine and unadulterated by the air.

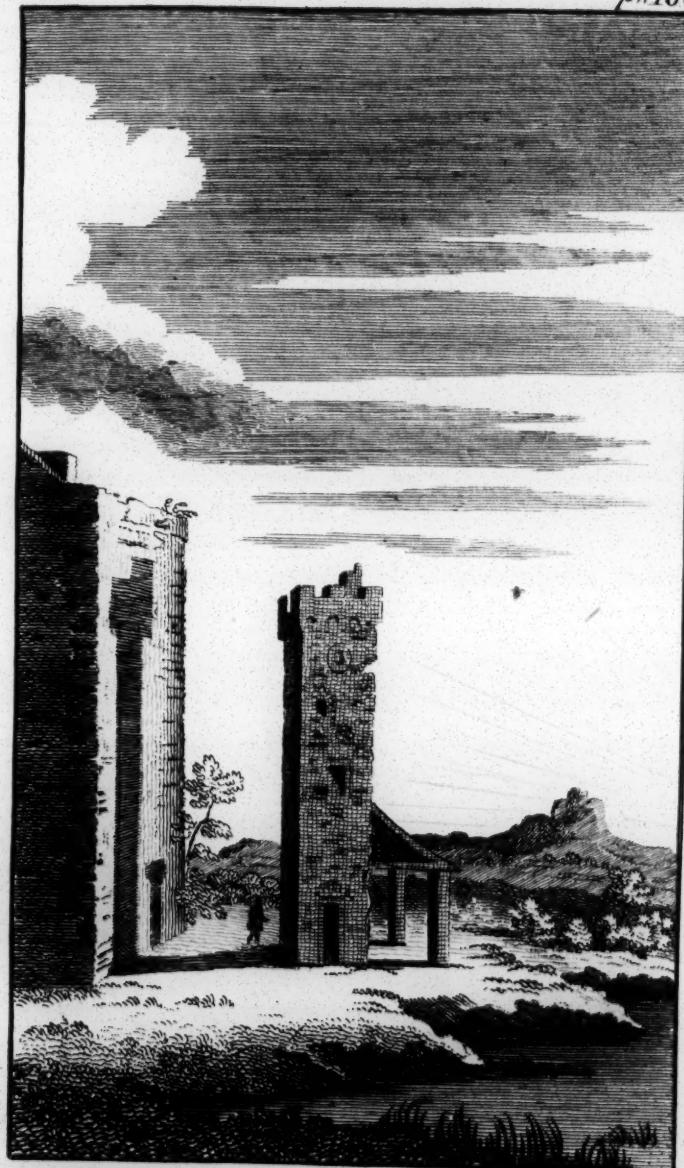
Why the shadows projected on a white wall towards the close of the day appear azure.

When the sun is near his setting, the shadows projected on white walls, open to the air, will always appear of the colour of azure. This follows from what we have already shewn, *viz.* That the surface of every opake body partakes of the colour of it's object ; whence, the whiteness of the wall, being altogether destitute of colour, must assume those of it's objects ; which, in this case, are the sun and the heavens : and since the sun in his evening's visit to the horizon, appears reddish, and the heavens azure ; and since those places where the shadows are found, are out of the reach of the sun ; we having elsewhere proved, that no luminous body has ever seen the shadow of any body illuminated by it ; it is obvious, that the shadow of the heavens, projected on the white wall, will appear azure ; and further, that the ground of that shadow, being illumined by the sun, will appear reddish, in conformity to the redness of it's luminary.

Of smoke.

That smoke, which is interposed between the sun and the eye that sees it, must appear brighter and more transparent than the smoke seen in any

p. 166



Pl. 22.



any other part of the painting. The same thing may be observed of dust, fog, and other like bodies, which ought always to appear obscure, when you are placed between them and the sun.

Smoke is more transparent, and of a colour less deep, towards the extremes of it's masses, than in the center, and towards the middle.

Smoke rises more obliquely, as the wind which drives it is more strong and violent.

Smoke appears under as many different colours as there are different causes to produce it.

Smoke never projects any shadows that are bold and defined, and it's extremes weaken by little and little ; becoming insensible as it removes further from it's origin. Those objects which are seen through it appear so much the less sensible, as it is more dense ; and it is found so much the whiter as it is nearer it's principle, and the more blueish as it is further removed.

Fire appears more obscure, as there is a greater quantity of smoke found between it and the eye.

Where the smoke is at the greatest distance, objects are the least dimmed and intercepted by it.

Paint a landskip dim and confused, as if shrouded in a thick fog ; smoke mounting in several places, with flames glaring in the lowest and thickest volumes ; and let the roots of the mountains appear less visible than the tops, as we have already observed of fogs.

The dust raised by the motion of any animal, appears clearer as it is mounted higher ; and, on the contrary, more obscure as it is lower ; supposing it between the sun and the eye.

The

Miscellaneous
rules and pre-
cepts for paint-
ing.

The surface of every opake body partakes of the colour of the transparent *medium* found between the eye and that surface ; and by how much that *medium* is more dense, and the space between the eye and the surface more great, by so much the colour, which the surface borrows from the *medium*, is found more strong.

The bounds or *contours* of opake bodies are so much the less visible, as those bodies are further removed from the eye which views them.

The parts of opake bodies will be the more strongly shadowed or illumined, as they are nearer the dark body, whence they have their shadow, or the luminous body that gives them light.

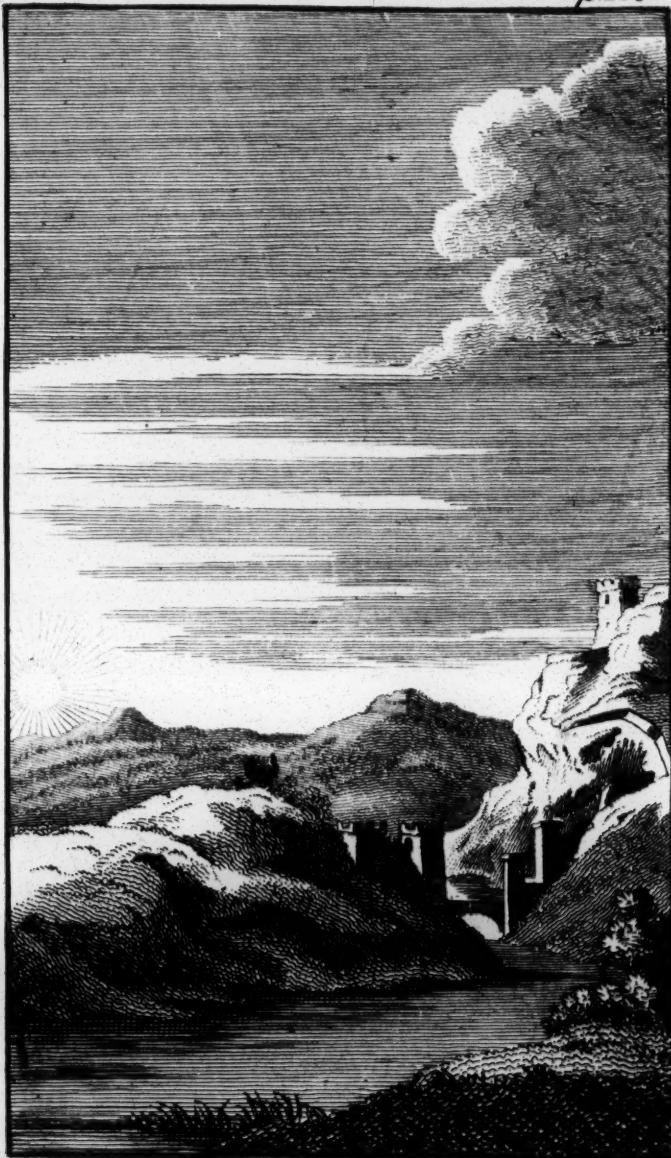
The surface of every opake body partakes more or less of the colour of it's object, as that object is more or less removed, or as it makes it's impression with a greater or less force.

Those things which are seen between light and darkness, appear with a greater *relievo*, than those which are seen entirely either in light or darkness.

When, in representing any distant scene, you paint your figures bold and distinct, these, instead of appearing far removed, will be seen near at hand. Use so much conduct and discretion, therefore, in your figures, as that they may shew their distances ; nor in imitating any object, whose bounds, on account of their distance, appear dim and indistinct, must you scruple to copy even that dimness and confusion in your figure.

Distant objects appear dim and confused in their *contours* for two reasons ;---the first is, that they come to the eye under so small an angle, that

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Pl. 23.



that their effect is like those of the smallest objects; as the nails of the fingers, the bodies of insects, or the like minute bodies, whose littleness prevents the eye from discerning their figure or parts: the second is, that remote objects have so much air interposed between them and the eye, that it has the effect of a fog, or some other dense medium, tinging and discolouring the shadows of objects with it's whiteness, and stripping them of their natural obscurity, till they appear of a blueish tincture; that being the middle between black and white.

Though several objects become invisible on account of their distance, yet those illumined by the sun can never fail of making some impression on the eye; the rest, which are unillumined, remaining wrapped up in shadow and obscurity; and since the air becomes more gross as it approaches nearer the earth, those things which are found the lowest will be the darkest and most confused; those more elevated, at the same time, appearing clearer and more distinct.

When the sun reddens the clouds over the horizon with his beams, these bodies which, by reason of their distance, participate of azure, will be likewise found tinged with a share of this redness; and this mixture or union of red and azure will beautify the champaign, and render it extremely pleasing and agreeable. All the opake bodies illumined with this mingled colour will appear very bright, being seen to border mostly upon the red, and the air will have a colour like to that of yellow flower-de-luces.

The air between the earth and the sun, at the time of his rising or setting, will obscure the objects found underneath it, more than any other portion of the hemisphere; it being here, that the air is found more white than in any other part.

Never draw the terms or *contours* of any body terminating on another, or to which another body serves as a *ground*, too bold and apparent; but let it be raised and loosened from the *ground* of itself.

One white curvilinear body terminating on another white body, will have it's *contour* dimmer and more obscure than any other of it's illumined parts; and, on the contrary, this same *contour*, if found on a dark *ground*, will appear brighter than any other illumined part of the object.

That thing will appear the most separated and remote from another, which is seen on a *ground* of a colour the most different from it's own.

The things, which first lose themselves at a distance, are the *contours* of such bodies as have the same colour, and are placed over one another; as for instance, one oak over another oak, &c. At a greater distance the extremes of bodies, which have a difference in colour, and which bound on each other, are found to disappear, as trees and ploughed ground, walls, the ruins of houses, the fragments of rocks or mountains; lastly, at a distance still greater, those things which are usually the most conspicuous, as bright and obscure bodies terminating on each other, dwindle and vanish.

Among bodies equally elevated above the eye, that which is placed at the greatest distance will appear

appear the lowest ; and of several bodies ranged equally below the eye, that will appear the lowest which is placed the nearest.

In a landscape which takes in far distant objects, those found on the banks of rivers, or lakes, will appear less than those seen at a distance from them.

Among bodies of equal densities, those nearest the eye will appear the least dense ; and on the contrary, those more dense, which are more remote.

Every object appears bigger, as the pupil of the eye, which views it, is larger. This you may be convinced of, by looking at one of the heavenly bodies through a small pin-hole made in a paper ; for that little perforation admitting but a small share of the light of the body, the object becomes diminished, and loses of it's usual magnitude, in proportion as the hole of the paper is smaller than the pupil of the eye.

The air being replete with gross vapours, the *contours* of bodies invested by it, become dim and confused ; and the bodies themselves appear larger than they are found to be in effect. The reason is, that though the linear perspective does not diminish the angle under which the image of the object strikes the eye, yet the perspective of colours, or the aerial perspective, throws back the body, and places it at an imaginary distance, much greater than it's real one ; so that while the one removes the object from the eye, the other preserves it in it's natural magnitude.

When the sun is near his setting, the dews, which are then observed to fall pretty plentifully, thicken and condense the air ; so that all objects unillumined by the sun, remain dark

and confused; those which are illumined, at the same time, receiving a tincture of red or yellow, according as the sun is found in the horizon. Further, those things then illumined by the sun, will be very evident, and will strike the eye very sensibly, especially buildings, the houses of towns and cities, and castles in the country; for their shadows will be very obscure and deep, and that opposition, found between the brightness of their upper illumined parts, and the darkness of their lower and shadowed ones, will give them an uncommon force and relieve.

A thing illumined by the sun, is further illumined by the air; whence arise two several shadows, whereof that will be the most obscure, whose central line is directed towards the center of the sun: and observe, that the central lines of the two lights, primitive and derivative, being continued within the shadow, will form the central lines of the primitive and derivative shadows.

It is a fine sight to observe, towards the evening, how the tops of houses, towns, castles, trees, and other elevated objects, are illumined and gilt with the beams of the setting luminary; all the rest at the same time remaining dim, and indistinct, receiving no light but from a dusky air, and that too weak to distinguish their lights from their shadows. Now those tall objects, being thus tinged and enlightened with the sun, to represent them in a painting, you must take some of the colour wherewith your sun is painted, and mingle it with the light parts of all the objects supposed to be illumined by it.

It

It often happens that a cloud appears obscure, without receiving a shadow from any other cloud: this is owing to the situation of the eye, which being found near the cloud, sees only so much of it as is shadowed; as in another place, or at a greater distance, it would discover both it's shadowed and illumined sides.

Of two bodies equally high, that which is seen at the greatest distance from the eye, will appear the lowest. Thus of the two clouds represented in *Fig. 9. Tab. 2.* though that nearest the eye be really the lowest, yet in appearance it will be the highest; the section of the visual rays of the first and lowest cloud, on the perpendicular *A N*, being found between the points *M A*, and that of the second and higher cloud, between the points *M N*, which is below *AM*. It may likewise happen, by an effect of the aerial perspective, that of two clouds, the one whereof is illumined by the sun, at his rising or setting, the other at the same time remaining obscure and unillumined, the latter, though really the lowest, and the nearest, shall yet appear both the remotest and the highest.

Supposing upon the wall *BC*, [*Tab. 2. Fig. 10.*] I paint the figure of a house, to appear at a mile's distance; and this done, I discover a real house, actually removed to that distance: these two houses I dispose so, by the side of each other, as that the sections of the line *AC*, made by each pyramid of visual rays, be equal; and yet after all, viewing these two houses with both eyes, they neither appear equally big, nor equally distant.

A painted figure will not appear at an equal distance with the natural object, though both seen under the same angle.

The thing principally to be considered, in of the grounds order to give a *relievo* to painting, is the ⁱⁿ paintings. *ground*:

ground : in which, it may be observed, that the terms or extremes of bodies which have convex surfaces, will usually shew themselves, even though both the body and the *ground* have the same colour. Now the reason of this is, that the convex terms, or *contours* of bodies, do seldom receive their light in the same manner as their *ground*, even when the same light is found to illumine them both ; so that the *contours* become frequently either brighter or more obscure, than the *ground* on which they are seen : but should it happen that a *contour*, besides having the same colour, should likewise be illumined, or obscured in the same degree with it's *ground* ; in that case, the *contour* must inevitably be lost, and the figure remain indistinguishable. It is for this reason, that a painter can never be too cautious in his *grounds* ; nor ever avoid this uniformity of lights and colours with too much study : for, as it is his chief aim to shew his figures raised, and advanced from the *ground* of his painting, and as this practice is found to have a quite contrary effect, to give into it would be to frustrate his endeavours, and to defeat himself of his end.

How to judge of
a painting.

The first things you are to consider in a painting are, whether the figures have a *relievo* answerable to the place wherin they are found, and to the light which they receive, and whether the shadows are not the same in the extremes, and in the middles of *groups* ; it being one thing to be encompassed on every side with shadows, and another to be barely shadowed on a single side. Now a figure in the middle of a *group* is under the first of these circumstances, being hemmed in with dark bodies on every hand ; whereas another in the extreme

is shared between the shadow diffused from the *group*, and the light it receives from it's luminary.

Observe, secondly, whether, by the *ordonnance* or disposition of the figure, they appear accommodated to the subject, and well suited to the history which they are intended to represent.

And, thirdly, whether the figures be attentive to the business, and to the occasion of their being there; and whether their *attitudes* and expression be suitable to the matter in hand.

An opake body will appear to have less *relievo*, as it is further distant from the eye. This is owing to the air found between the eye and the opake body; which, being brighter than the shadow of the said body, weakens the force, and diminishes the obscurity of that shadow; tinging it with it's own light, and adulterating it with it's azure; whence, of course, the body loses it's *relievo*.

The *contour* of any illumined member will appear more obscure, as the *ground* on which it is seen is more bright; and for the same reason, it will appear more clear as it's *ground* is more obscure. Lastly, if it be flat, and the *ground* bright, like to it in colour, and equal to it in brightness, the *contour* will be insensible.

The bounds of bodies are less evident, as they are seen at a greater distance. This is a maxim that can never be repeated too often; it being the foundation of a rule of the last importance, *viz.* that the *contours* of objects must be drawn more or less strong, as they are more or less remote. Now the termination or bounding

Objects appear with less *relievo* as they are more remote.]

Where the contours are the most visible.

Of the bounds or extremes of bodies.

ding of one thing upon another, is in reality no more than a mathematical line, not having the properties of a physical one. Neither can the term between two colours be properly called a line, the one beginning where the other ends, without the interposition of any other thing. Learn, therefore, never to be too coarse in your *contours*, but especially where the objects are supposed at a distance ; nature, which is every where else to be followed, being not here to be departed from.

Of the shadows
of remote ob-
jects.

In representing remote objects, observe never to trace the precise bounds of the shadows, but rather leave them at large and undetermined. Now, for representations of this kind, it will be proper to pitch on the evening, or, at least, on some cloudy season ; since that will give you a fair occasion of leaving your lights and shadows undefined, and their bounds somewhat confused ; and will free you from any necessity of the contrary practice, which is the more to be avoided, as it is not only difficult to execute, but disagreeable in the effect ; the shadows, in that case, appearing like so many spots or blotches at a distance. Remember, likewise, never to paint your shadows so extremely deep, as that by their blackness they absorb, or drown their original colour, excepting the place wherein they are found be dark and gloomy. Lastly, observe that the *contours* be not seen, especially those of the hair. Nor let any of your lights appear of a pure untainted white, unless where it is requisite that the genuine colour of some white object should shew itself.

Various rules
and precepts in
painting.

The figure and bounds of an object are never seen distinctly, either in it's lights or shadows ; but it is in the intermediate parts, where

where neither the light, nor the shadow are considerable, that they are the most clearly distinguished.

Perspective, as it relates to painting, is divided into three principal parts; the first of which consists in diminishing the magnitude or dimensions of bodies, suitably to their different distances; the second considers the weakening or diminution of the colours of such bodies; and the third is that which regards the bounds or *contours* of bodies, teaching how to make them fainter or more sensible, as the objects are more or less remote; it depending on the ease or difficulty of tracing the bounds of objects, that they appear more or less distinct, or more or less distant.

The azure of the air is a compound colour, formed out of light and darkness. By light, I mean the particles of vapours diffused through the air, and illumined by the sun; and by darkness the pure air, not charged with any heterogeneous particles, to receive and reflect the light of the sun. An instance of this may be seen in the air, interposed between the eye and a mountain, darkened by means of the great number of trees wherewith it is beset, or viewed on that side turned from the sun; for the intermediate air will here be found of two colours; whereof, that opposed to the obscure part of the mountain will be azure; the other being different; and the more so, if the light part of the mountain be seen covered with snow.

Among things equally obscure, and equi-distant, that will appear the most obscure which is found on the brightest ground; and *vice versa*.

A a

That

That figure which shews the greatest share of black and white, will appear with the greatest degree of *relievo*; it is for this reason that I would advise the painter to cloath his figures with the brightest and most vivid of his colours; those which are obscure, being unable either to give them a *relievo*, or to make them visible at a distance; the reason of which is, that every shadow is obscure, either in a greater or less degree, so that a drapery, of a dim obscure dye, will appear too uniform, and alike in it's lights and shadows; whereas, in those, whose colours are brighter, the difference between their lights and shadows will be the more evident, and the greater.

Whya painting, though imitated with the greatest art, and finished to the last perfection, both with regard to it's *contour*, it's lights, it's shadows, and it's colours, will never shew a *relievo* equal to that of the natural objects, unless these be viewed at a distance, and with a single eye; as may be thus demonstrated:—suppose the two eyes *A B* viewing the object *C*, at the concourse of the two central lines, or visual rays, *AC, BC*; [Tab. 2. Fig. 2.] In this case, I say, that the lines or sides of the visual angle, including those two central lines, will see the space *GD* beyond and behind the said object; and the eye *A* will see the space *FD*, and the eye *B* the space *GE*; so that the two eyes will see behind the object *C* the whole space *FE*.

By which means, that object *C* becomes, as it were, transparent, according to the usual definition of transparency, which is that beyond which nothing is hidden. Now, this can never happen where the object is only viewed with a single eye; and where that eye is less in

in extent than the object which it views; whence the truth of our proposition is fairly evinced; a painted figure intercepting the whole space behind it; so that the eye is precluded from the sight of any part of the *ground* found behind the circumference of that figure.

Figures painted on a bright and illuminated *ground*, will appear with a greater *relievo*, than if painted on a *ground* more obscure: the reason is, that in order to give your figure the greater force and freedom, you make that part of it which is the furthest removed from the light, the least illuminated by it; whence it becomes obscure: so that coming to terminate on an obscure *ground*, it's extremes are rendered dim, and appear confused, and of a piece with the *ground* itself; insomuch, that without the assistance of some *reflex* to be conducted thither, your work will remain devoid both of spirit and grace; nor will any part of it, excepting it's lights, be so much as seen at a distance. And this is the effect of an obscure *ground*, which prevents the *relievo* of figures, cutting off, and mutilating them of all their unillumined parts.

A figure exposed to an universal light, will appear more graceful than if illuminated by a particular one; the reason is, that a large and strong light encompasses, and (as it were) embraces the *relievo's* of bodies; so that the figures illuminated thereby, will appear with force and freedom, and will even preserve themselves at a considerable distance: whereas, those supposed in a chamber, or illuminated by any other little and narrow light, will receive very large as well as very deep shadows: and paintings

A light ground preferable to a dark one, with regard to raising and loosening your figures from the bottom of the painting.

that are shadowed in this manner, never make any other appearance at a distance, than that of a dim, tinged, and flat surface.

In painting a
landskip, regard
to be had to the
climate and the
quality of the
place.

Observe that in representing any place near the sea, or in a southern clime, you never shew the trees, or the fields, in a winter piece, the same as they are seen in countries more remote from the sea, and advanced towards the north; excepting such trees as preserve their verdure all the year, and which are continually fending out new leaves.

What is to be
observed in re-
presenting the
autumn.

In an autumn-piece, let every thing be represented suitably to the season. Thus towards the beginning of that quarter, let the leaves, found on the oldest branches of trees, begin to appear pale, and in a greater or less degree, as the soil is more barren or fertile; still avoiding the common fault of painters, who make no scruple of giving the same colour, and the same kind of verdure, to all sorts of trees, provided they be but viewed from equal distances. The same thing must be understood of meadows, rocks, trunks of trees, and of all kinds of vegetables; wherein you must always introduce a variety, in imitation of nature, who in this, as in other parts of her kingdom, diversifies her works in a manner that surpasses all imagination.

A rule to be
observed in re-
presenting the
wind.

In representing the wind, besides bending the boughs of trees, and turning back their leaves towards the side, whither the wind blows, observe that the dust be raised aloft, and confusedly blended with the air.

How to repre-
sent the begin-
ning of a
shower.

A shower in falling, darkens the air, and gives it a precarious tincture; being found to receive the light of the sun on the one side, and being shadowed on the side opposite thereto,

as is observed in clouds ; the earth becomes overspread with a dusk, or gloom, it's light being intercepted by the descending shower. Objects seen through it will appear obscure and indistinguishable ; those near at hand being, however, the most evident and distinct : and it must be observed, that such as are found on the shadowed side of the shower, will be more conspicuous than those on the side illumined ; the reason of which is, that the former lose nothing but their principal lights, whereas the latter lose not only their lights, but their shadows too ; their illumined parts being confused with the brightness of the air, and the shadowed parts, likewise, illumined and weakened, by means of the said enlightened air.

The shadow of a bridge can never be seen on the water running underneath it, unless that water have first lost it's transparency, by being troubled and muddy ; the reason is, that clear water having a bright and polished surface, the image of the bridge cast on it, is reflected back to all parts, placed at equal angles, between the eye and the body of the bridge ; and even under the arches where the shadow of the bridge should be cast, instead thereof is exhibited the image of the air, which can never happen when the water is foul and turbid ; since it's lustre and transparency, to which it owes, that is, has the effect of a mirror, are in that case destroyed ; whence it becomes disposed to receive a shadow, in the same manner as a dusty street.

Perspective is the rule of painting ; the bigness of a painted figure ought to discover the distance at which it is seen ; and where a figure

Of the shadows
of bridges
thrown on the
water under-
neath them.

Of the use of
perspective in
painting.

gure appears as big as the life, it will shew itself to be near the eye.

Of the equilibrium of figures.

The navel is always found in the central line of the stomach, which is over it, and is affected in the same manner by a foreign or accidental weight, as with the natural weight of it's own body. This is seen in stretching out the arm, where the hand, at it's extreme, has the effect of a weight at the end of a steelyard; so that to preserve the equipoise, it becomes necessary to throw so much of the natural weight of the body on the other side of the navel, as is equivalent to the necessary weight of the extended arm and it's hand; to which end it is frequently found necessary to raise the heel of that side, and to keep it suspended from the ground.

How to make a statue.

To make a figure in marble, in the first place form a model of it in clay; and when that is finished, and dry, place it in a coffin, large enough to contain the block of marble, whereon you intend to work. This coffin having it's sides perforated in several places, you must provide little white rods, such as will enter precisely within those perforations; push these through the several holes, till they come to touch the several parts of the model opposite to them; and distinguish so much of the rods as remains without the coffin, with black, giving each rod and it's respective hole some particular mark, that you may be enabled, on occasion, to match them again: this done, take your clay model out of it's coffin, and bestow the block of marble in it's place, striking so much off it, and bringing it so far down, till such time as all your rods enter through their holes, to their former depth, and hide their white

white parts within the coffin: in order to do which with the more conveniency, let your coffin be so contrived, as that it may be drawn up, and suspended; the bottom all the while remaining firm under the marble: thus your tools will be the more manageable, and you may cut off as much as you please, with ease and expedition.

Having drawn your *design* on a sheet of fine paper, well stretched in a frame, lay over it a skin of pitch and fine brick-dust, well incorporated together, covering this again with a lay of Spanish white and masticot; this done, proceed to colour your *design*, and lastly to varnish it; using to this purpose some old oil, clear and defecate, but of a good body: after which, there remains nothing but to stick it to a glass, which must be flat and very smooth. It will, however, be the better way to take a square piece of earth well vitrified, laying over it the mixture of white and masticot; afterwards painting it, applying the varnish, and covering it with a chrystral; but first it will be necessary, that your painting be well dried in a stove, after which you may varnish it with nut-oil and amber, or barely with nut-oil, taking care that it be well purified, and thickened in the sun.*

To paint upon linen, take the following method: in the first place, stretch the piece of linen intended for your painting, on a frame, and wash it slightly over with size,

How to secure
a painting from
decay, and to
preserve it al-
ways fresh and
unfaded.

* N. B. The art of painting in *enamel*, invented not long ago, refers very naturally to this head; and as it is now managed, is preferable to that here described by the author.

which

which being thoroughly dried, lay on your colours with little brushes, made of hog's bristles; and at the same time, while it is fresh, trace out your shadows. The *carnations* must be formed of Spanish white, lake, and masticot; and the shadows, of black and umber, with a little mixture of lake. After you have gone slightly over the several parts of your painting, let it dry; which done, touch it over again with lake, that has been steeped a long time in gum water; this being the fitter for the purpose, because it does not bear any lustre when used. To make your shadows the deeper, take some of this gummed lake, and mix it with ink: now this will be a tincture of very good use, since, being transparent, it will serve to shadow several very different colours, as lake, azure, vermillion, &c.

Of the use of perspective in representing objects that appear dim either on account of distance or of the density of the medium.

When on any occasion you find yourself unable to discover any difference in the brightness of the lights, or in the obscurity of the shadows of an object that you would imitate, in that case you may set aside the perspective of colours, and only make use of the lineal perspective, to diminish the figures in proportion to their distances; and of the aerial perspective, to diminish and weaken their evidency, by shewing them less finished and distinct.

The eye will never discover the interval between two objects differently distant, by means of the mere lineal perspective, unless further aided by the reasoning deduced from the aerial perspective.

The effect of the distance of objects.

That part of an object which is nearest the luminous body, whence it has it's light, will be the most strongly illumined.

The

The images of objects lose a degree of force, at every degree of distance; that is, in proportion as an object is seen more remote, it's species is more intercepted in it's passage through the air, and it strikes the eye with less vigour.

Observe that the weakening and alteration of the colours of objects, be equal to the diminution of their magnitudes.

By how much a transparent *medium*, found ^{Of the medium between the eye and it's object.} between the eye, and it's object, is more spacious, and it's interposition greater, by so much the more will the natural colour of the object be transformed into that of it's *medium*.

When an object is so disposed between the eye and the light, as that it is found in the central line, passing between the centers of the light, and of the eye; that object must remain entirely dark, and devoid of light.

The draperies, wherewith your figures are cloathed, ought to be so disposed around the members which they cover, as that there be no folds or plaits with obscure shadows, found on any of the illumined parts of the figures; nor any folds that receive too bright and glaring lights, seen on those parts of the figure that are shadowed: and further, let both the *contours*, and folds of the drapery, be so managed, as that in some places they may follow, and fall in with the natural shape of the parts which they cover; still avoiding any of those unnatural *contours*, which seem to cut and enter within the quick of the members, with shadows that are too deep, and indented too far for the surface of the body. Let the drapery be so accommodated, as that it may not appear a garment without a body; that is, a heap of stuffs or cloaths put off, and out of use; a

fault too common among the painters, who are so taken with a great deal of drapery, thrown into a great many folds and plaits, that forgetting the proper use of cloaths, which is to cover the parts of the body decently, and with grace, they load their figures instead of dressing them, and make the members appear like so many bladders, bloated and blown up in the parts that have *relievo*: thus making them an easy prey to the next high wind that blows. Now the folds of drapery are not to be disused, but to be better regulated; being both necessary, and of good effect, provided they be conducted with discretion, and judiciously accommodated to those parts of the figure, where the members, on account of their action, or of the *attitude* of the whole body, amass, and gather the parts of the drapery together. Above all, observe, that in histories, or in pieces consisting of several figures, you shew a variety in the draperies; so that if the folds of some appear gross and stiff, as if the cloth were thick and stubborn, let the folds of others sit closer and more neatly, as consisting of a finer thread; the sides and edges of the one being straighter, and those of the other more indented.

Of the different ways of representing the folds in drapery.

Most painters chuse to shew their draperies much ruffled, their turns and angles very sudden and acute; others take a foster course, and make their angles almost insensible; and others use no angles at all, contenting themselves with little cavities, or sinkings in.

How to conduct the folds of a drapery.

That part of a fold which is the most remote from it's center, or from the place of it's restraint, whence the fold commences, will recover more of it's natural state, than any other part.





part. This is owing to a faculty, which all natural things are found to have in common with each other, to wit, self-preservation, or an endeavour to preserve their own manners of being; in consequence of which, a stuff uniform and alike in it's thickness and strength, endeavours to continue flat and even; so that when, on account of some fold or plait, it is forced to quit it's natural habitude, it struggles continually to retrieve itself; and still in proportion as it recedes from the place of it's constraint, it approaches nearer to it's original plainness, by expanding and unfolding itself. Thus, for instance, suppose *A B C* the fold of a drapery, and *A B* the place where it receives it's force or constriction, I have already shewn that the part most remote from the rise or root of a fold, will have recovered the greatest share of it's natural form; whence it follows, that *C* being the most distant part of the fold, will likewise be wider, plainer, and more expanded than any other part.

Never let your drapery be too much disordered and embarrassed with folds: on the contrary, let these only be seen in such places as are drawn, or held back, by the hands and arms; letting the rest hang at large, or fall naturally and unconstrained. Now the best course you can here take, will be to copy from natural; thus, for instance, if it be a woollen drapery that you would represent, *design* it's folds from a stuff of the same kind; so if you would have it appear of silk, or some other fine stuff, or even of a coarse country kersey for your clowns to appear in, observe the same rule; and diversify every one, by the form and manner of it's folds; declining the ordinary

Rules for de-
signing a dra-
pery.

practice of painters in this respect, who use to *design* their draperies from models covered with paper or thin skins; a method in which they lie extremely liable to be imposed upon.

Of the folds seen in the draperies of members that are shortened.

Where a figure is shortened, let the folds be closer together, and drawn round the member in greater numbers, than where it is not shortened: thus the eye being placed in *E*, the figure *M N* throws the middle of each circulating fold, further from it's extreme, as it is more remote from the eye; *N O* shews the extremes almost straight, being found directly over against the eye; and *P Q* has an effect quite contrary to the first, *N M*.

Of the shadows of the folds.

The shadows found within the folds of the drapery, will be the more obscure as the cavity, or indenture, where the shadow is produced, is more directly opposed to the eye which views it: with this limitation, however, that the situation of the eye be between the illumined, and the shadowed part of the figure.

The folds of the drapery to correspond to the attitude of the figure.

In whatever action your figures are engaged, let their draperies be seen in a disposition correspondent; still making the folds, and *contours*, conspire together, and accommodating these so perfectly to the posture, as that there be no room for doubt, or uncertainty, with regard to the real *attitude* of the figure. And take especial care that none of the folds be too deep, nor appear to reach below the surface of the body. Lastly, whenever you represent a figure dressed with several garments, one over another, take care that it do not appear as if there were a skeleton so dressed: but let the bigness of the whole figure be so proportioned, as that besides the thickness of the several







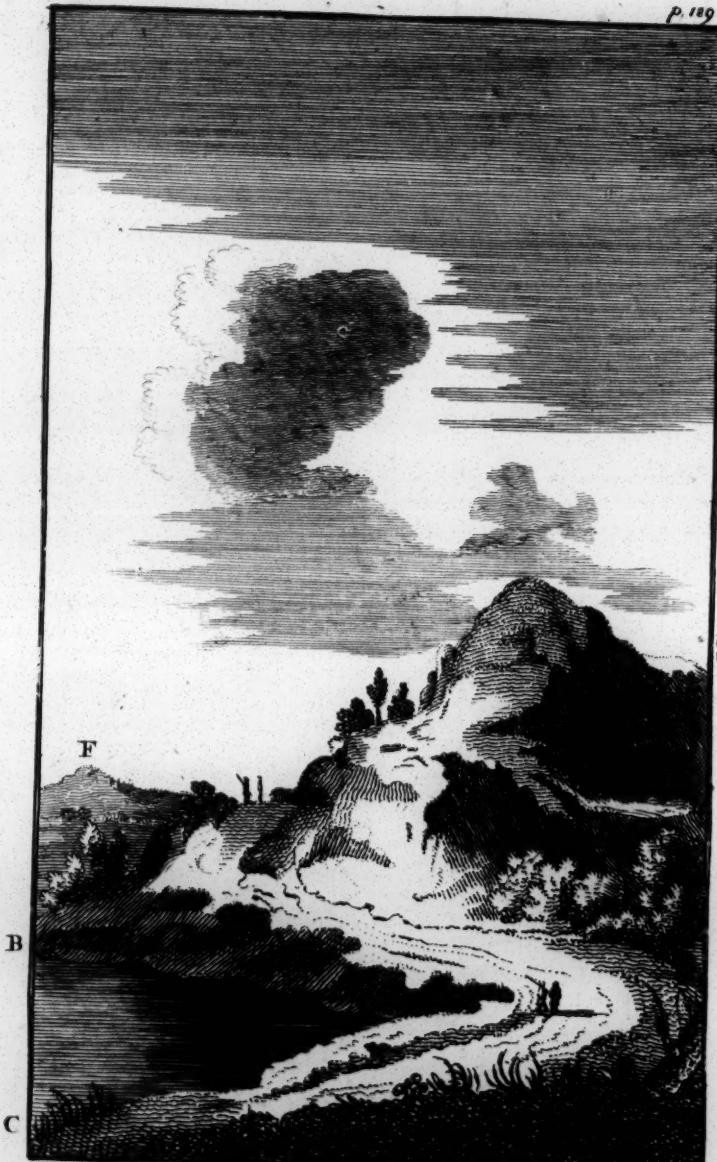
Pl 25.



Pl 26.







several garments, there appear a body of a reasonable bulk underneath.

The folds of the drapery, wherewith any member is covered, ought to fall off, and diminish towards the extremes of the part which they encompass.

The length of those folds which set the closest to the body, must be seen wrinkled on that side, whereon any member bends and is shortened, and distended on the side opposite.

From the sixth proposition of our treatise of perspective, it appears, that the horizon ^{Of the horizon} will be seen exhibited as in a mirror, on that ^{appearing in the} side of a water opposite to the horizon and to the eye. An instance of this you have in the adjacent figure, where the horizon *F* is opposed to the side *BC*, and that side, at the same time, opposed to the eye. Let the painter, therefore, who would represent any wide extent of water, consider that this element has no other colour, whether bright or obscure, but what it receives from the brightness or obscurity of the place, wherein it is found; intermingled with the colours of such other objects, as it is encompassed withal.



Tab. 1.

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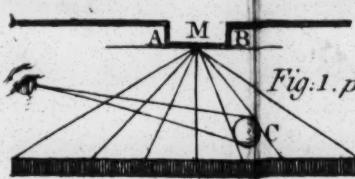
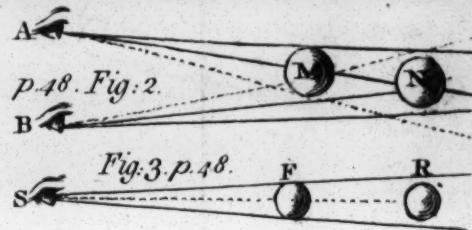


Fig. 1. p. 42.



p. 48. Fig. 2.

Fig. 3. p. 48.



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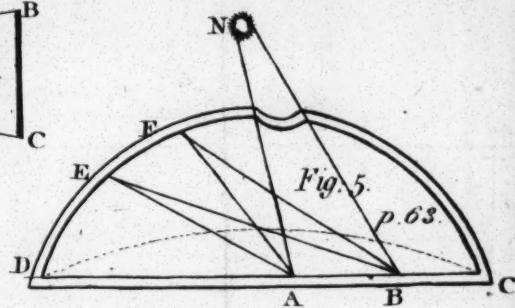


Fig. 5. p. 63.

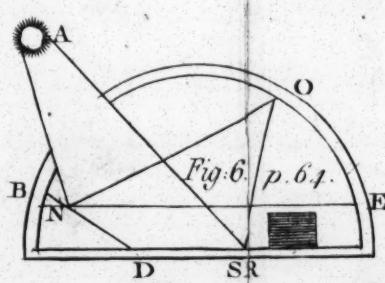


Fig. 6. p. 64.

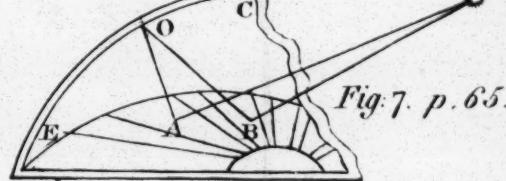


Fig. 7. p. 65.

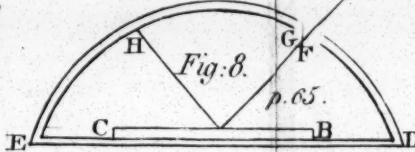
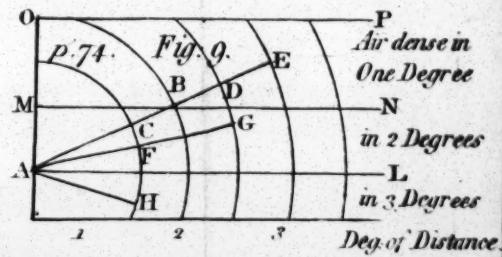


Fig. 8. p. 65.



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Fig. 11. p. 80.



Fig. 12. p. 86.

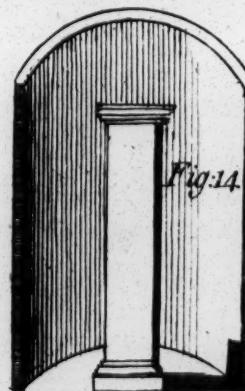


Fig. 14. p. 88.

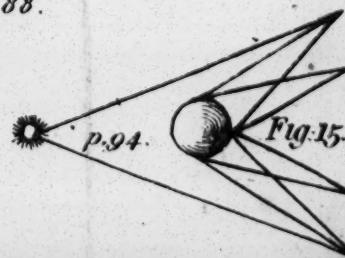
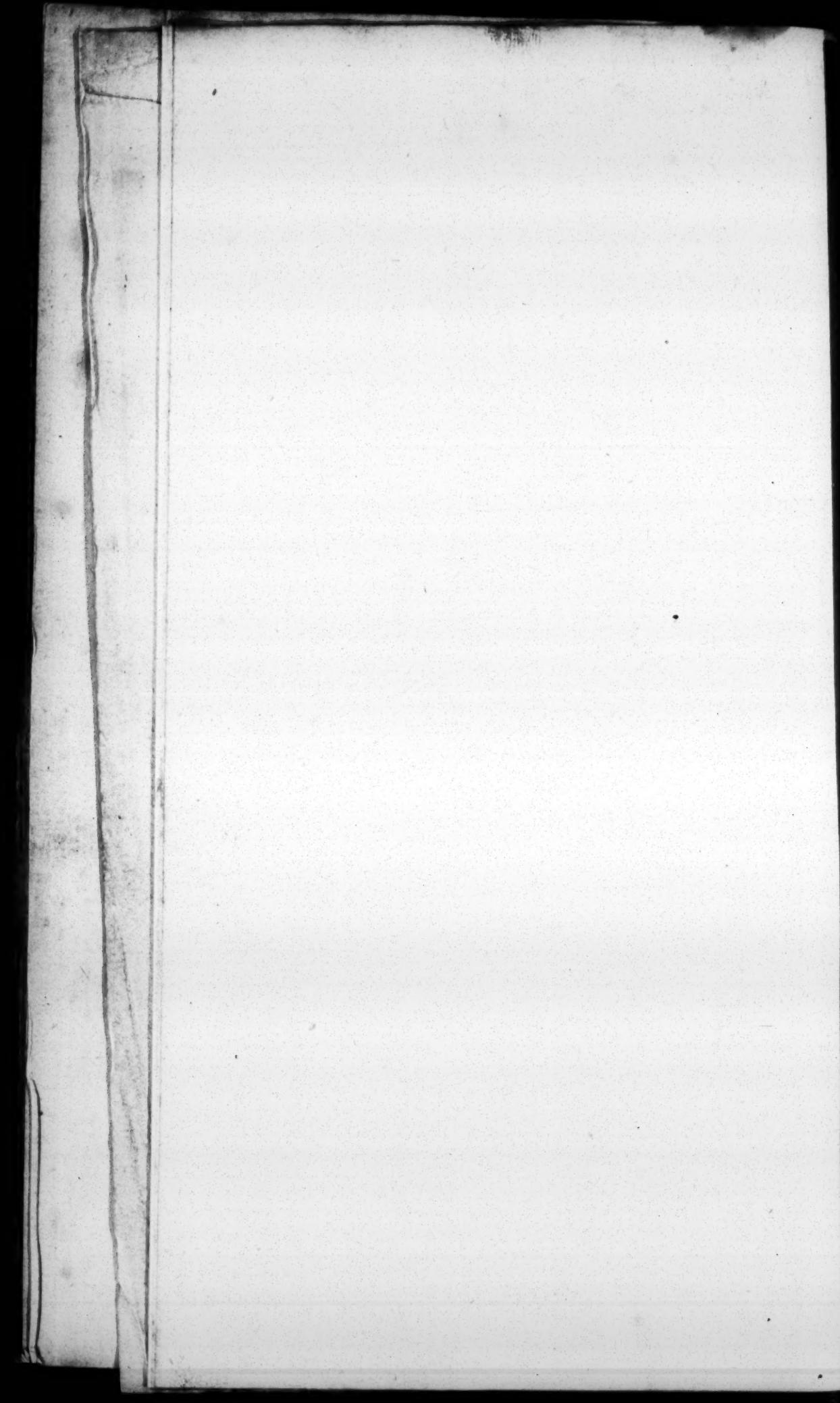
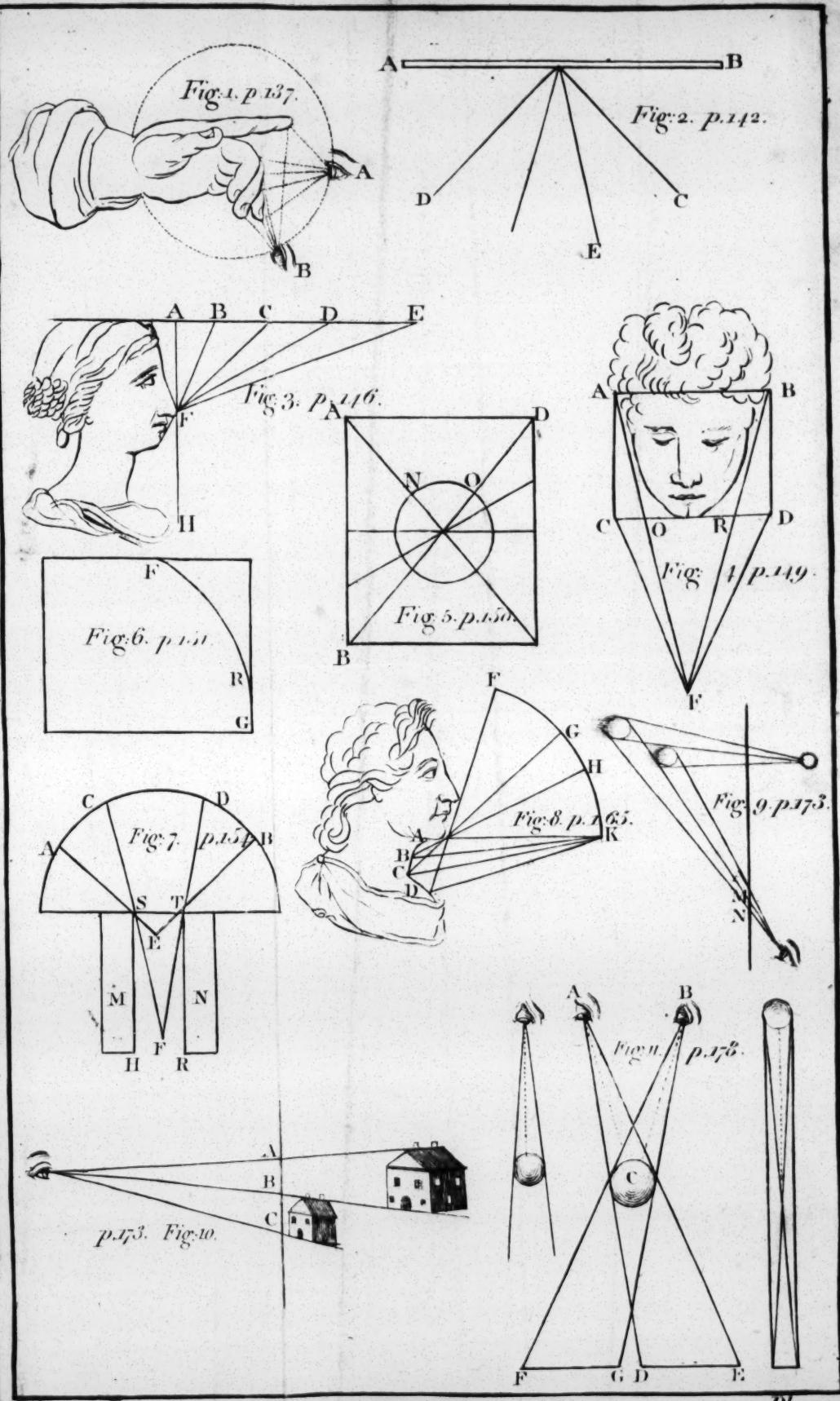
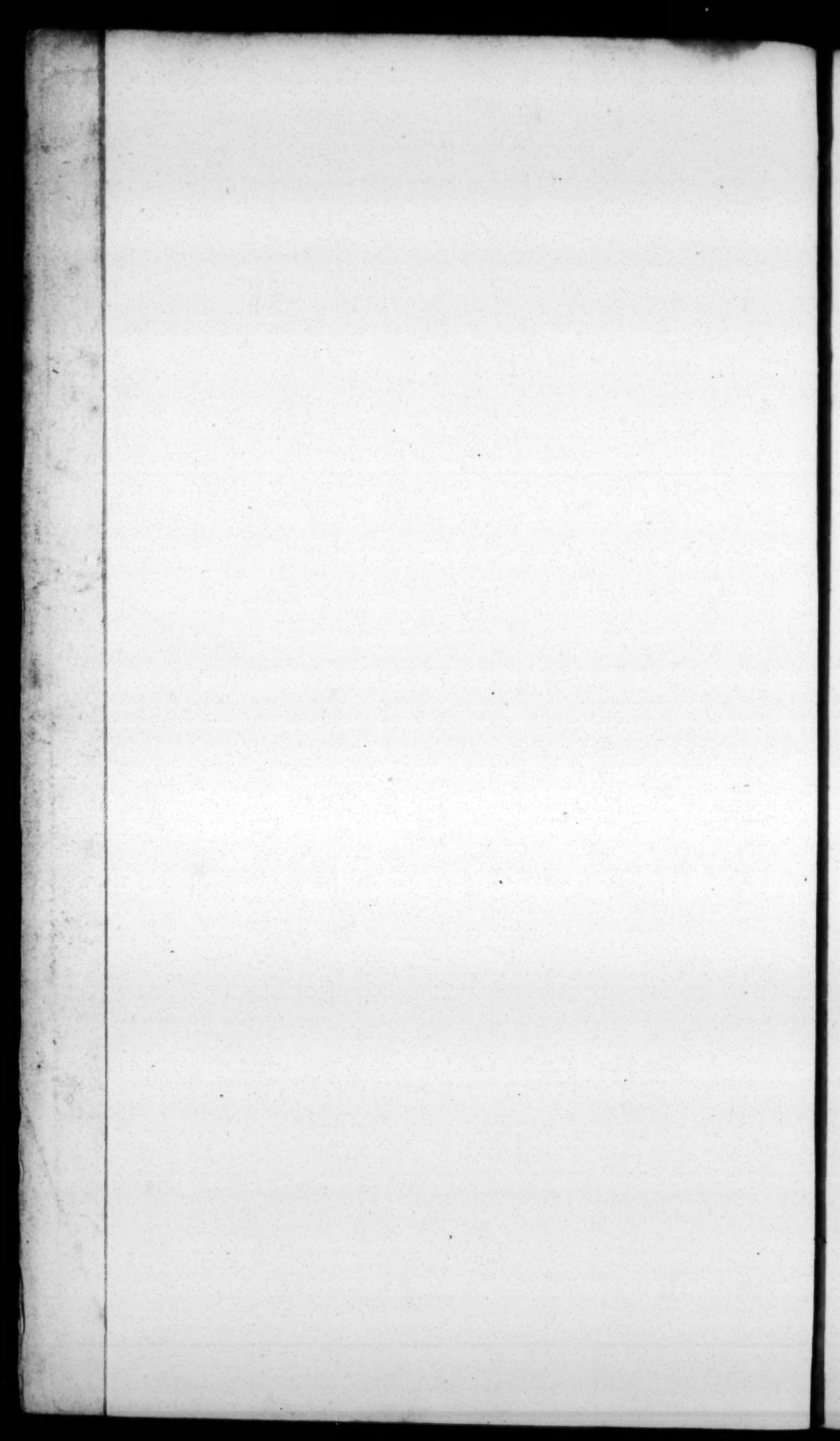


Fig. 15. p. 94.







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